



The Influence of Safety Culture (SC) on Hotel Employees' Safe-Behavior during the Crisis of Covid-19

Mohammed N. Elziny*, Hany E. Mohamed

Faculty of Tourism and Hotel Management, Helwan University, Egypt

ARTICLE INFO

Keywords:

Safety culture
Safe-behavior
Crisis
Covid-19
Hotels

ABSTRACT

Several investigations on crisis management are demonstrating interest in the role of occupational safety culture awareness factors. Thus, focusing on safety culture factors is an essential issue in health and safety as a means of the mitigating crisis caused by nature in the workplace. This study investigates the influence of hotel safety culture on employees' safe-behavior during the crisis of Covid-19 in order to recommend some practices and allowing those who in charge of this industry to follow during this period to overcome this crisis. Therefore, the first step is to identify the relevant safety culture factors. A measurement tool in the form of a questionnaire was used to explore the impact of hotel safety culture (HSC) on employee safe-behavior. The questionnaire survey contains twelve constructs, namely: "risk management; safety training; safety knowledge; safety rules; safety perceptions; safety supervision; safety commitment; safety rewards and punishment; safety environment; safety communication; safety compliance and safety participation". Confirmatory factor analysis (CFA) was utilized to analyze 257 questionnaire forms collected from employees. The study results depict six safety culture factors out of ten proposed (risk management; safety training; safety rules; safety supervision; safety environment; safety communication) were the most important factors affecting employees' safe-behavior during the crisis of COVID-19.

©2020 Faculty of Tourism and Hotels, Fayoum University All rights reserved

1. Introduction

Covid-19 is an acronym for Corona Virus 2019, a septic infection disease that causes the severe acute respiratory syndrome. This novel virus was first detected in Wuhan, China, in 2019, and has globally been spreading and challenging, causing the global pandemic 2019-2020 Corona pandemic. This virus has caused mass destruction in many sectors, leading to a recent global economic crisis. With the widespread of

this virus and the imposition of many international restrictions on travel and community mobility on a large-scale, tourism was broadly ceased in March 2020. This, in turn, has caused havoc in the global tourism and hotel industry (Hoisington, 2020). The travel and tourism sector is perhaps the most hard-hit facing collapse due to this global health crisis and is in a fight for survival (Guevara, 2020). The hotel workforce faces potentially devastating hardships due

* Corresponding author N. Elziny, email. mohammed_nagi_fth@yahoo.com

to travel restrictions, self-isolation, and social distancing, which, in turn, caused many jobs to be lost. Moreover, the hotel market has significantly slumped, as hotel revenues (revenue-per-available-room RevPAR) have decreased significantly in most international chains and are predicted to decline due to fear of this virus (Courtney, 2020). Overall, the tourism and hotel industry confront international distortions because of the crisis of COVID-19.

To overcome this crisis, governments have imposed a set of precautionary measures that guarantee the safety of their people and prevent infection spread among workers in various institutions, whether governmental or private sector. These measures include washing hands regularly, covering mouth and nose, and avoiding close contact with others. Then each organization has put in place a set of particular standard recommendations to which their employees must adhere to prevent the spread of the disease. Hotels are especially vulnerable to unexpected threats such as terrorist attacks, natural disasters, and epidemics (Paraskevas, 2013; Hung et al., 2018). These unexpected threats prompt hotel managers to take measures to cope crises challenges (Chen, 2011; Chan & Lam, 2013). One of these measures is related to employees' awareness about work safety through establishing a workplace safety culture (Manning, 2018).

Several studies into work safety have focused on accident rates of manufacturing and construction (Zhou et al., 2015; Misiurek & Misiurek, 2017). Other researchers have focused on safety issues to improve occupational safety by creating safety-culture scales (Warszawska & Kraslawski, 2016). However, little research has targeted safety culture in the hotel sector. The unprecedented effects of the COVID-19 on hotels around the world will encourage researchers to strengthen safety culture theory to help hoteliers to recover from this disaster. Essentially, this research paper discusses the effects of hotel safety culture on employees' safe-behavior and outlines a research model from ten dimensions to protect their employees from diseases and raise the level of health awareness which will finally improve their performance and develop knowledge in the hotel sector during the crisis of COVID-19.

2. Literature Review and hypothesis

2.1. Global Epidemics and Hotel Industry

The hotel managers faced severe challenges due to the nature of the hotel industry (Chen, 2011). This industry is characterized by certain features that

threaten its operation in many cases (Chan & Lam, 2013; Mohammad, 2014; Hung et al., 2018). Researchers consider the vulnerable nature of the hotel industry represents a major threat as unexpected catastrophes can negatively impact its operation, including external economic, political, or ecological forces (Reid & Bojanic, 2009; Racherla & Hu, 2009; Runyoro & Kideghesho, 2010; Paraskevas, 2013).

The tourism and hotel industry is mainly affected by the outbreak of infectious diseases (Mohammad, 2014). In the last decades, the potentiality of disease dissemination has been increased as a reason of the fast means of transportation and other global airlines which finally threatened the tourism industry significantly (Wilder-Smith, 2006). The hotel industry pursues to satisfy customers' desires without being exposed to any threats (Specht, 2006). However, customers can be exposed to danger due to disease outbreaks and threaten their life. Ritchie (2009) added that tourism and hotel demand is threatened because of disasters of biological and epidemics as a result of the increased human mobility.

The hotel industry has suffered from many epidemics both nationally and internationally. During 2001 and 2002, the world has been affected by two different types of epidemics (foot and mouth disease in the UK and severe acute respiratory syndrome SARS in China) (Ritchie, 2009). These epidemics outbreaks have had a severe negative impact on the global tourism industry (Gu & Wall, 2006). Over thousand cases of the disease were identified and reported worldwide to the World Health Organization (WHO). The outset of these epidemics caused a loss of billions of dollars from the potential tourism receipts worldwide. English Tourism industry lost about £8.5 billion because of the foot and mouth disease outbreak (Ritchie, 2009) and around \$15 billion due to SARS (Tew et al., 2008).

Recently, Corona Virus 2019 (COVID-19) is the most famous biological disaster in this decade. COVID-19 has first been discovered in the province of Wuhan, China, in early 2020 and by the 15th of June 2020 over 100 thousand cases of COVID-19 have been reported worldwide to the World Health Organization (WHO). The virus has killed approximately ten of thousands and infected many more thousands. COVID-19 outbreak has had a severe negative impact on the tourism and hotel industry. Although its negative impact has been global, Wuhan, Hong Kong, Italy, the USA and the Middle East countries have been the most affected destinations (Hoisington, 2020). UNWTO (2020) reported that the COVID-19 outbreak has

resulted in a loss of about 80 US\$ billion in exports, 67 million fewer international tourist arrivals, US\$ 910 billion to US\$ 1.2 trillion loss from the potential tourism receipts worldwide, 100 to 120 million direct tourism jobs at risk and 100% destinations with travel restrictions.

This global crisis has led to a demand downturn in the hotel industry; causing negative consequences on both the hotel sector and countries level in general (Ayittei et al., 2020; ILO, 2020). On the hotel level, the decrease in the volume of revenues has led to the suspension of many hotels which have closed some of their facilities, in addition to reducing the industry investment opportunities due to the decrease of the available capital for new projects (Estrada et al., 2020). On the other hand, on the destinations/countries level, the negative consequences have exceeded all activities directly associated with the hotel sector, including restaurants and airlines, to all sectors of the economy in the countries due to decreased GDP as a direct result of reduced flow of foreign currencies and the high levels of unemployment rates (UNWTO, 2020; Chinazzi et al., 2020).

2.2. Crisis Management

Crisis as can be defined as an unpredictable high-impact event and the low probability that seriously threatens the organizations and characterized by uncertainty which requires quick decisions and responses (Hilliard, 2009; Parnell et al., 2010). The researchers suggested that hotels should adopt a crisis management approach for handling it regardless of its reasons (Issa & Altinay, 2006; Ritchie, 2009). Consequently, crisis management is a set of measures designed and adopted by management with external stakeholders to prevent or reduce potential damages resulting from the outcomes of crises and, thus, protect the industry from the negative consequences (Hilliard, 2009). Hence, managers should consider how to plan for the crisis by asking themselves a set of questions regarding the most impactful crises that could seriously threaten the property and the previous crisis history (Parnell et al., 2010).

From these perspectives, three main reasons drive hoteliers to adopt a crisis management approach. Globalization is the first one due to the interconnectedness of the world to the extent that minor crises occasionally have a significant impact on the whole world. The second reason is the economic importance of the hotel industry, which constitutes a significant pressure on both governments and stakeholders to devise various strategies to manage

crises and reduce their adverse effects. Third, any political, social, economic, technological, and environmental change at the country level makes small and individual hotels more vulnerable to threaten their business, requiring an effective plan to handle such crises or disasters (Malhotra & Venkatesh, 2009).

There are many frameworks and approaches proposed for crisis management (i.e., Models endorsed by Smith, 1995; Malhotra & Venkatesh, 2009; Ritchie, 2009). The most valuable framework to this research paper is Malhotra and Venkatesh's (2009) model. Malhotra and Venkatesh (2009) developed a two-phase model including proactive and reactive responses' stages. The proactive stage includes practices undertaken before a crisis happens to avert or mitigate its occurrence. However, the reactive stage includes procedures undertaken after a crisis occurs in order to handle and resolve it. Simultaneously, the most severe crises mentioned were caused by nature (such as tsunamis, floods, forest fires, hurricanes, or diseases). In proactive responses' stage, hotel managers should involve planning and preparing for unforeseen events through designing action plans for all departments and training their employees on how to respond appropriately to any concerns. Therefore, this paper highlights safety culture procedures already practiced by hotels as a proactive stage to react well during the crisis of COVID-19.

2.3. Safety Culture in Hotel Industry (HSC)

Sukadarin et al. (2012) stated that the primary purpose of applying a safety culture is to decrease occupational injuries and restrain unsafe behavior. Morrow et al. (2014) added that institutions that implement safety culture seek to develop strategies that urge employees to pay attention to work risks and enhance safety performance. Establishing a safety culture is an effective tool in crisis management because it enables organizations to improve their safety performance (Silbey, 2009; The State of Queensland, 2013). Researchers began to present their definitions of safety culture after International Atomic Energy Agency (IAEA) which proposed their safety culture model in 1991. Various studies have paid attention to the safety culture concept and discussed it widely (Hofmann et al., 2017; Kalteh et al., 2019).

Moreover, researchers have developed a set of approaches and frameworks related to safety culture theory. Researchers of the present research reviewed a number of these models to formulate the suitable foundation framework for their research. Kuo et al. (2020) proposed the "Hotel Safety Culture" model,

which divides safety culture into five interacting categories: training factors, psychological factors, organization factors, environmental factors and behavior factors. These categories form a single bloc. Hence, to establish a safe workplace, these categories must be carried on.

2.3.1. Safety Training and Risk Assessment

In terms of training factors, Kuo et al. (2020) suggested that safety culture functions should include procedures related to safety training and risk assessment. Fleming & Lardner (1999) stated that about 90% of organizations' accidents resulted from humans due to neglecting safety in the workplace. One of the biggest mistakes that organizations make is to overlook comprehensive safety training and risk assessment (Lee & Harrison, 2000). Therefore, organizations should raise the awareness level of safety issues by establishing a safety culture to reduce workplace accidents. Safety training is the best key factor based on establishing safety courses to educate employees on how to respond to unsafe work situations and to improve their personal protection safety culture (Rakowska & Szubielska, 2013). Moreover, the establishment of a safety culture can act as an effective tool for risk management. Risk assessment enables hotels to enhance their safety performance through the measurement, diagnosis, and improvement of the safety culture (Kalth et al., 2019). Besides, establishing a safety culture requires that the hotel understands what efforts are made to manage risk perception in the work environment (Vierendeels et al., 2018).

2.3.2. Safety Psychology

Employees' psychological factor is a hidden state from knowledge, rules, abilities, and individual perception, so psychology surveys are required to confirm individual's safety values. Drawing on the model of Kuo et al. (2020), the current research developed the following three dimensions of safety psychological factors. These psychological dimensions are used to assess employees' aspects such as safety knowledge, safety rules and safety perception and attitude of individuals within the organization (Vierendeels et al., 2018).

Safety knowledge can be defined as the individual's information, beliefs, experiences, skills and memories of safety (Cooper, 2001). Safety knowledge is one of the essential aspects which help employees to understand workplace hazards and work safely to be more productive. Another role of safety knowledge is to provide employees with a better understanding of

the safety programs to control those (Real, 2008). Moreover, employees should be aware of some specific rules in the organization safety program by carrying out assigned safety and health responsibilities into their daily activities (Easter et al., 2004; Manduku, 2015). These safety rules include reporting injuries, concerns, illnesses, and incidents, submitting an effective safety report and participating in incident investigations.... etc (Senya, 2017). Employee safety perception and attitude is another dimension of psychological factors that could add information about the safety management system at all levels (Tam & Fung, 2012). Several studies of risk perception and attitude (i.e., Williamson et al., 1997; Gyekye, 2006; Silbery, 2009) have demonstrated that psychological processes significantly control employees' perceived risks. Work safety and health perceptions of employees may concern the risk types and their severity, the quality of the work conditions, management commitment and responsiveness to safety procedures, and arrangements for managing safety matters, listed among the other safety factors (Gander et al., 2011).

2.3.3. Safety Organization

The research model has focused on the safety organizational dimensions as a management safety system is indispensable. Thus, to assess the effectiveness of this system, these organizational elements are used (Chinda, 2014; Glendon et al., 2016). The safety organizational domain refers to organizational perceptual factors such as safety supervision, safety commitment, and safety reward and punishment (Kuo et al., 2020). To establish safety culture awareness, a sound safety management system must be applied, and supervisors should state a proper implementation of safety procedures (Widerszal-Bazyl & Warszewska-Makuch, 2008; Srivastava, 2017).

Safe supervision of employees is the process that is responsible for ensuring that the work environment remains safe (Pidgeon, 1998; Glendon et al., 2016). Hotel managers and supervisors play an essential role in the promotion of a particular safety culture through establishing workplace injury prevention programs (DaRos, 2011; Srivastava, 2017). In addition, managers should set up a transparent safety reward system to encourage long-term attitude change of their employees (Fell-Carlson, 2004). A safety rewarding system will have an evident positive influence on employee behaviors through emotional feedback,

financial incentives, social recognition ...etc (Kuo et al., 2020).

2.3.4. Safety Environment and Communication

For a hazard-less working environment, a safety management system must be established. High fatality and injury rates in work environment are a result of the risk-laden and stressful environments (Sönmez et al., 2017). Hence, providing a safe work environment is considered to be the most critical factor, especially in the hotel industry (Tsaur & Tang, 2012). The work environment in the hotel industry is characterized by long working hours and job stress. Moreover, specific job roles required the use of chemicals and sharpening machines, which makes employees more vulnerable to the risk of injuries and hazards (Srivastava, 2017). Drawing on the model as mentioned above of Kuo et al. (2020), the environmental factors include safety environment and safety communication.

In terms of hotel safety environment, hotel managers must inform their employees about all hazards that could be faced during workplace (Glendon et al., 2016). Moreover, management should improve employees' knowledge about safety culture through noticing and responding to unsafe situations, thereby providing them with clear, safe behavioral standards (Wang & Sun, 2014; Kuo et al., 2020). On the other hand, in terms of safety communication, it is essential that every manager must listen to its employees' suggestions and concerns (Suhanyiova et al., 2016). Moreover, employees should exchange ideas and information with each other to improve workplace safety and prevent risks and illness (Rakowska & Szubielska, 2013; Vierendeels et al., 2018). Besides, hotel management can design a system like a safety and health committee and health suggestion funds to encourage employees to speak up about workplace hazards and communicate without fear of reprisal. Hence, employees will receive all information about the safety program and safety issues related to their workplace (Kuo et al., 2020).

2.4. Employees' Safe Related Behavior

There have been many academic researchers in safety awareness and employee safety-related behavior. Hotels, like any organization, should raise awareness among employees about safety hazards and urge them to take responsibility for their personal safety (Tsai, 2004; Tarlow, 2014).

Kapp (2012) defined safety-related behavior as a variety of activities that individuals undertake to protect themselves and to maintain a safe workplace incorporating procedures for individuals to comply

with established safety rules as well as ongoing employee behaviors that help improve the overall level of safety in their workplace. These activities include providing ideas and suggestions about tools and solutions to improve safety in the organization and participate in volunteer safety committees. Griffin and Neal (2000) as well as Kapp (2012) have conceptualized a safe-related behavior scale, focusing on both dimensions of safety compliance and safety participation. There is a big difference between both safety compliance and safety participation behavior. Safety compliance behavior can be defined as the set of basic rules that an organization imposes on its employees to maintain a safe work environment (i.e., usage instructions for one of the kitchen equipment) (Tsai, 2004). However, safety participation behavior is the attitude of an individual that indirectly helps develop a safe work environment (Griffin & Neal, 2000; Wang & Sun, 2014).

All in all, these safety culture tips can help managers to increase employees' safety awareness and establish a coherent safety message in the hotel, especially during this period of Covid-19. Establishing this culture may take some time for employees to learn and follow the rules, but these ideas, in turn, will help to create a safer work environment. Hence, literature confirms the importance of safety culture in improving employee's safety performance. Therefore, the researchers focus on the SC in hotel industry. Following these views, twenty hypotheses and a proposed model (see Fig. 1) are presented below:

H1: Employees' safety compliance behavior positively influenced by hotel safety culture principles.

H1a: Safety Risk Management has a positive impact on Employees' Safety Compliance.

H1b: Safety Training has a positive impact on Employees' Safety Compliance.

H1c: Safety Knowledge has a positive impact on Employees' Safety Compliance.

H1d: Safety Rules have a positive impact on Employees' Safety Compliance.

H1e: Safety Perceptions and Attitudes have a positive impact on Employees' Safety Compliance.

H1f: Safety Supervision has a positive impact on Employees' Safety Compliance.

H1g: Safety Commitment has a positive impact on Employees' Safety Compliance.

H1h: Safety reward and punishment have a positive impact on Employees' Safety Compliance.

H1i: Safety environment has a positive impact on Employees' Safety Compliance.

H1j: Safety communication has a positive impact on Employees' Safety Compliance.

H2. Employees' safety participation behavior positively influenced by hotel safety culture principles.

H2a: Safety Risk Management has a positive impact on Employees' Safety Participation.

H2b: Safety Training has a positive impact on Employees' Safety Participation.

H2c: Safety Knowledge has a positive impact on Employees' Safety Participation.

H2d: Safety Rules has a positive impact on Employees' Safety Participation.

H2e: Safety Perceptions and Attitudes have a positive impact on Employees' Safety Participation.

H2f: Safety Supervision has a positive impact on Employees' Safety Participation.

H2g: Safety Commitment has a positive impact on Employees' Safety Participation.

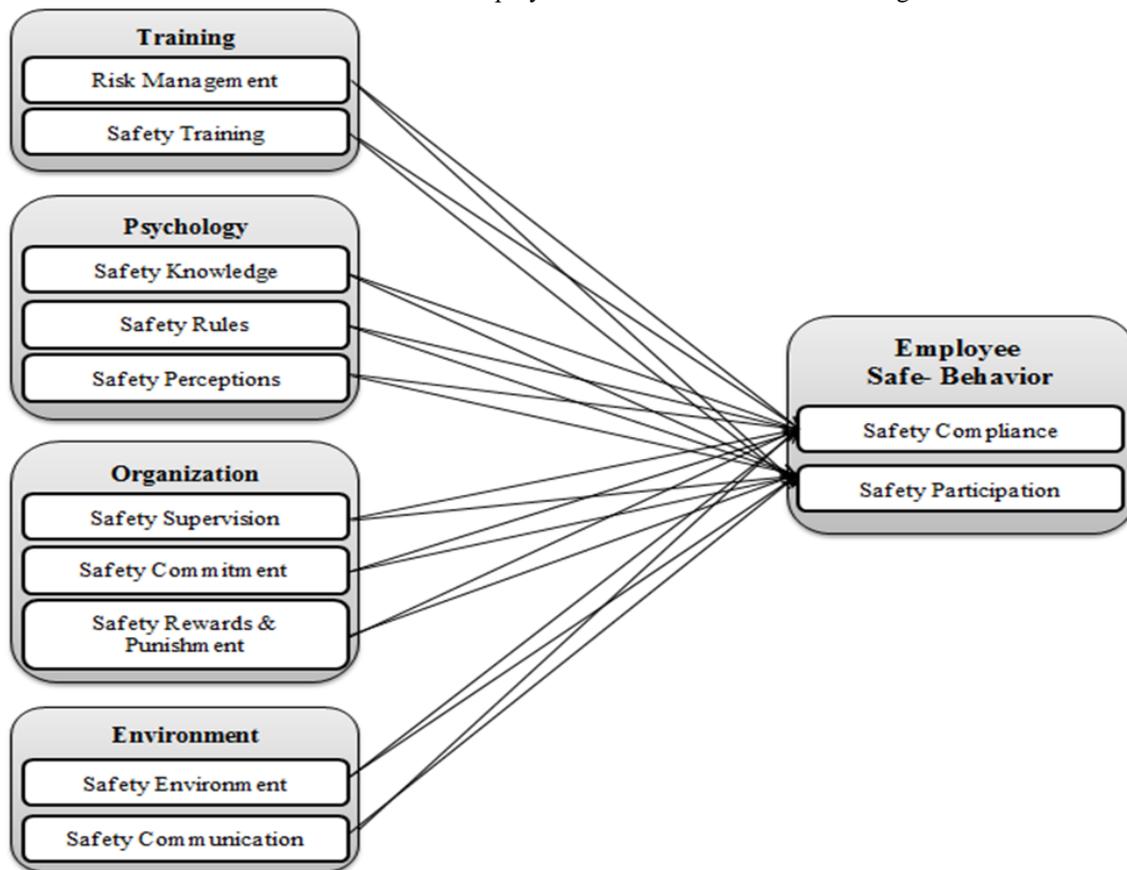
H2h: Safety reward and punishment have a positive impact on Employees' Safety Participation.

H2i: Safety environment has a positive impact on Employees' Safety Participation.

H2j: Safety communication has a positive impact on Employees' Safety Participation.

Figure 1

Proposed research model of the influence of SC on employees' safe-behavior in hotels during the crisis of Covid-19



(Adapted from, Kapp, 2012; Kuo et al., 2020).

3. Methodology

This study employed a paper-based survey because of the data-gathering instrument adapted and revised from previous studies (Kapp, 2012 and Kuo *et al.*, 2020). The final questionnaire items are shown in table (1) along with their sources. The questionnaire was

fine-tuned through discussions with academic staff, hotel managers and specialists from the ministry of tourism. The questionnaire was pilot tested to evaluate the questions' wording, the question sequence, and length.

The questionnaire was divided into two sections. In the first section, employees were asked to rate 42 items in

response to the question: to what extent do you agree or disagree with each statement? On 7 points Likert scale. Questions 1-4 measured risk management construct, questions 5-8 measured safety training, questions 9-11 measured safety knowledge, questions 12-14 measured safety rules, questions 15-19 measured safety perceptions, questions 20-22 measured safety supervision, questions 23-24 measured safety commitment, questions 25-27 measured safety rewards and punishment, questions 28-30 measured safety environment, questions 31-34 measured safety communication, questions 35-38 measured safety compliance and questions 39-42 measured safety participation of employee safe-behavior. The second section asked employees for demographic profile (i.e., age, gender, education, working experience and job position).

The target population for this study was five-star hotel employees who may have an interest and/or influence. Therefore, convenience sampling was utilized. The paper-based survey was developed and distributed from May 2020 through August 2020. A total of 300 questionnaire forms were distributed to five-star hotel employees. Among the questionnaires returned, 257 were usable ones, representing a response rate of 85.6 percent.

For the descriptive analysis, SPSS version 20 was used. On the other hand, Structural equation modeling (SEM) was used to test the measurement model of safety culture and employees' safe-behavior using AMOS 4. Moreover, goodness-of-fit measures were utilized to assess the structural fit of the hypothesized model. The final questionnaire items are listed in Table 1.

Table 1

Construct measurements

Construct	Code	Measure	Mean	Std. Dev.
Training (TT)				
Risk Management	RM1	The incident report and investigation system of the hotel are complete.	4.84	1.30
	RM2	The hotel cares and concerns about the employee training need and effect.	5.57	1.14
	RM3	The hotel sets up hazard prevention, control, and management procedures for significant hazards.	5.23	1.11
	RM4	The hotel conducts a risk assessment of the operating environment of each department.	5.19	1.15
Safety Training	ST1	The hotel provides sufficient resources (such as human resources and budget) to enforce employee training.	5.90	0.93
	ST2	Through safety training courses, the employees understand the hazard factors at work.	5.83	1.11
	ST3	Using safety training courses, the employees and directors mutually communicate and interact.	5.61	1.07
	ST4	The hotel safety management system includes operation procedures, equipment management, and employee safety.	5.81	0.93
Psychology (PP)				
Safety Knowledge	SK1	The employees understand and are familiar with the emergency procedures.	5.34	1.11
	SK2	The employees understand the definition of the term "safety culture".	5.27	1.14
	SK3	The employees are proud of complying with the rules of health and safety.	5.53	1.10
Safety Rules	SR1	The employees comply with the standard operating procedures and codes of safety practice.	5.64	1.09
	SR2	The employees are more cautious when performing unfamiliar tasks.	5.62	1.03
	SR3	The employees operate in compliance with the safety procedures when directors are off-site	5.60	1.11
Safety Perceptions	SP1	The employees stay alert during working hours.	4.71	1.41
	SP2	The employees are aware of their operation scope of safety procedures.	5.57	1.14
	SP3	The status of the industrial safety department in the organization is valued.	5.08	1.38
	SP4	The employees know how to protect their safety at work.	3.84	1.71
	SP5	The employees comply with the unsafe behaviors corrected by the directors.	4.82	1.37
Organization (OO)				
Safety Supervision	SS1	The hotel directors promote the safety rules often and supervise and care about the employees at the workplace.	5.71	0.84

	SS2	The hotel directors pay lots of attention to the work/occupational safety of the new employees.	5.33	0.95
	SS3	The hotel directors prioritize safety when operation performance conflicts with safety.	5.82	0.89
Safety Commitment	SC1	The hotel periodically inspects firefighting equipment, machinery and instruments.	5.85	1.86
	SC2	The hotel emphasizes that the most important thing is to accomplish our tasks safely.	5.64	1.90
Safety Rewards and Punishment	SRP1	The hotel sets clear safety reward-and-punishment procedures.	4.66	0.95
	SRP2	The safety reward measures of the hotel are helpful to promote safety performance.	4.95	0.81
	SRP3	The hotel directors periodically evaluate the safety attitude of the employees for improvement.	5.06	1.03
Environment (EE)				
Safety Environment	SE1	The hotel provides protective instruments/tools such as gloves, alcoholic spray, and medical muzzles.	5.96	1.66
	SE2	The hotel holds first-aid personnel training courses periodically.	5.33	1.84
	SE3	Equipment of the hotel has a maintenance schedule.	5.72	1.04
Safety Communication	SCO1	The hotel requests all employees to rehearse emergency responses.	6.20	1.88
	SCO2	The hotel maintains a clean/tidy work environment.	5.94	1.52
	SCO3	The hotel advocates relevant work laws, regulations, and specifications.	5.83	1.09
	SCO4	The employees proactively discuss operation safety problems with colleagues and directors.	6.31	0.97
Employees' Safe-Behavior				
Safety Compliance	SCM1	"I use safe procedures for handling hazardous materials."	5.88	1.82
	SCM2	"I use the correct personal protective equipment for the task I am doing."	5.43	1.80
	SCM3	"I report unsafe behavior of colleagues to directors."	4.68	1.52
	SCM4	"I prioritize safety when my work conflicts with safety"	5.91	1.48
Safety Participation	SPA1	"I volunteer for safety-related tasks."	6.22	1.92
	SPA2	"I often take part in the development of the safety requirements for my job"	5.90	1.04
	SPA3	"I pay attention to my colleagues' actions if they are likely to be hazardous."	6.30	1.11
	SPA4	"I correct others' work when they violate safety rules."	6.08	1.02

Statistical Package for the Social Sciences (SPSS) version 20 was used to analyze the factors influencing hotel employees' safe-behavior as a result of the concept of hotel safety culture (i.e. 42 items) descriptively. Forty-two items were analyzed by their means and standard deviations as showed in table (1). Table (1) shows that employees were primarily committed to hotel safety culture, as follows: "The employees proactively discuss operation safety problems with colleagues and directors" (M = 6.31); "The hotel requests all employees to rehearse emergency responses" (M = 6.20); "The hotel provides protective instruments/tools such as gloves, safety shoes and earplugs" (M = 5.96); "The hotel maintains a clean/tidy work environment" (M = 5.94); "The hotel provides sufficient resources (such as manpower and budget) to enforce employee training" (M = 5.90); "The hotel periodically inspects firefighting equipment, machinery and instruments" (M = 5.85). However, the employees disagreed with

safety perceptions as "The employees know how to protect their own safety at work" (M = 3.84).

3.1. Data analysis

Structural Equation Modeling (SEM) technique was adopted using Analysis of moment structure (AMOS). AMOS is statistical software and it stands for analysis of moment structures. It is an added SPSS module, and is specially used for Structural Equation Modeling, path analysis, and confirmatory factor analysis. It is also known as analysis of covariance or causal modeling software. First, Confirmatory Factor Analysis (CFA) was utilized to trail the measurement model of safety culture behavior. Second, Cronbach α and composite reliability (CR) were utilized to test the constructs' reliability.

4. Results and Discussion

4.1. Personal Profile

This study investigated employees' safe-behavior during the crisis of Covid-19. A survey was distributed to 300 employees. Among the questionnaires returned, 257 were usable ones, constituting a response rate of 85.6percent. Table (2) represents the profile of employees who took part in the study. Among the 257 employees who participated in the study, 60.7% were males and 39.3% were females. The majority of employees (37.7%) was 25 years old or below, followed by 32.7% of employees who aged 26-35 years old, and 14.4% were between 36-45 years old. Most of employees (60.3%) had a university education, followed by 23.3%, 14.7% of employees had secondary education and higher education respectively, and finally, 1.5% had primary education. Most employees' (66.5%) experience ranged from 2 - 5 years, followed by only 14.8% of employees who had less than one-year-experience and 10.9% had experience from 6 to 10 years. The majority of employees (37.0%) work as frontline staff, followed by 30.4%, 28.3% of employees work as team leaders and at supervision level respectively and finally 4.3% were department managers or above.

Table 2

Profile of respondents (N=207)

Demographic Data		Frequency	%
Age	25 years old or below	97	37.7
	26–35 years old	84	32.7
	36–45 years old	37	14.5
	46–55 years old	23	8.9
	56 years old or above	16	6.2
Gender	Male	156	60.7
	Female	101	39.3
Education	Primary	4	1.5
	Secondary	60	23.3
	University	155	60.3
	Post	38	14.7
Time worked in the hotel	One year or less	38	14.8
	2–5 years	171	66.5
	6–10 years	28	10.9
	Over 10 years	20	7.8
Job position	Frontline staff	95	37.0
	Team leader	78	30.4
	Supervisor	73	28.3
	Department manager or above	11	4.3

4.2. Analysis of Measurement Model

4.2.1. Confirmatory factor analysis (CFA)

In this study, a confirmatory factor analysis (CFA) was used to test the reliability and validity of the twelve constructs (i.e., risk management; safety training; safety knowledge; safety rules; safety perceptions; safety supervision; safety commitment; safety rewards

and punishment; safety environment; safety communication; safety compliance and safety participation), and the measurement model overall fit. To test the reliability, the CR and Cronbach's α in this study exceeded the minimum acceptable level of 0.7, demonstrating a good reliability level (Hair et al., 2010). To test the validity, the AVE exceeded the minimum acceptable level of 0.5, representing good convergent validity (see Table 3) (Hair et al., 2010). The initial model was not a satisfactory fit and so some modification indices were suggested to improve the model fit. More specifically, one item was removed from the safety perceptions and attitude scale (i.e., the employees know how to protect their safety at work). Numerous model goodness-of-fit measures suggest a satisfactory model fit. A good model fit was achieved for the measurement model: $\chi^2(601) = 848.838$; $p < .0001$, $2/df = 1.25$, lower than the acceptable value of 3, goodness-of-fit index (GFI) = 0.90, adjusted goodness-of-fit index (AGFI) = 0.91, normal fit index (NFI) = 0.93, comparative fit index (CFI) = 0.95, relative fit index (RFI) = 0.91, Tucker–Lewis index (TLI) = 0.94, which were all higher than the acceptable level of 0.90; and root mean square error of approximation (RMSEA) = 0.025,, lower than the acceptable value of 0.08 (Hair et al., 2010; Arbuckle, 2011). The CFA results showed that the lowest value of CR and Cronbach α for all of the constructs was 0.70, which exceeded the minimum acceptable value of 0.70 (Pallant, 2005), proving that data are considered to be reliable. Finally, the t-values for all the parameter estimates were statistically significant at the 0.1 percent level.

Table 3

Factor loadings, validity analysis, and reliability test of the measurement model

Construct	Factor loading	CR	A	AVE
Risk Management		0.86	0.85	0.62
SM1	0.63			
SM2	0.76			
SM3	0.90			
SM4	0.83			
Safety Training		0.81	0.80	0.52
ST1	0.74			
ST2	0.72			
ST3	0.69			
ST4	0.75			
Safety knowledge		0.88	0.86	0.724
SK1	0.79			
SK2	0.86			
SK3	0.88			
Safety Rules		0.89	.88	0.738
SR1	0.85			

Construct	Factor loading	CR	A	AVE
SR2	0.86			
SR3	0.85			
Safety Perceptions and Attitude		0.90	0.89	0.704
PAS1	0.81			
PAS2	0.87			
PAS3	0.83			
PAS5	0.83			
Safety Supervision		0.85	0.83	0.667
SS1	0.61			
SS2	0.83			
SS3	0.96			
Safety Commitment		0.73	0.70	0.577
SC1	0.71			
SC2	0.79			
Safety Rewards and punishment		0.85	0.83	0.665
SRP1	0.85			
SRP2	0.90			
SRP3	0.66			
Safety Environment		0.79	0.80	0.581
SE1	0.63			
SE2	0.63			
SE3	0.97			
Safety Communication		0.89	0.86	0.673
SCO1	0.83			
SCO2	0.85			
SCO3	0.66			
SCO4	0.92			
Safety Compliance		0.85	0.84	0.602
SCM1	0.84			
SCM2	0.87			
SCM3	0.78			
SCM4	0.58			
Safety Participation		0.91	0.89	0.721
SPA1	0.86			
SPA2	0.88			
SPA3	0.71			
SPA4	0.93			

Note: All factor loadings were significant at $\leq .001$; CR = Composite reliability; α = Alpha reliability; AVE = average variance extracted.

Table 4

Standardized parameter estimates of the structural model.

H	Path	Beta coefficients (β)	t-values	Results
H1a	Risk Management \longrightarrow Safety Compliance	1.91	0.13*	Supported
H1b	Safety Training \longrightarrow Safety Compliance	0.34	4.81***	Supported
H1c	Safety knowledge \longrightarrow Safety Compliance	1.68	0.11	Rejected
H1d	Safety Rules \longrightarrow Safety Compliance	0.29	3.28**	Supported
H1e	Safety Perceptions \longrightarrow Safety Compliance	-0.09	1.49*	Rejected
H1f	Safety Supervision \longrightarrow Safety Compliance	0.28	2.65**	Supported
H1g	Safety Commitment \longrightarrow Safety Compliance	0.12	0.14	Rejected
H1h	Safety Rewards \longrightarrow Safety Compliance	0.32	2.99**	Supported
H1i	Safety Environment \longrightarrow Safety Compliance	0.52	3.74***	Supported
H1j	Safety Communication \longrightarrow Safety Compliance	0.56	5.34***	Supported
H2a	Risk Management \longrightarrow Safety Participation	0.20	3.25**	Supported

4.2.2. Structural model and Hypotheses testing

The standardized path coefficients (β) and t-values, presented in Table (4) were utilized to test the study hypotheses. Firstly, the findings revealed that safety compliance positively influenced by risk management ($\beta = 1.91$; t-value = 0.13); safety training ($\beta = 0.34$; t-value = 4.81); safety rules ($\beta = 0.29$; t-value = 3.28); safety supervision ($\beta = 0.28$; t-value = 2.65); safety rewards ($\beta = 0.32$; t-value = 2.99); safety environment ($\beta = 0.52$; t-value = 3.74) and safety communication ($\beta = 0.56$; t-value = 5.34), supported seven hypotheses as assumed, H1a; H1b; H1d; H1f; H1h; H1i and H1j respectively. Meanwhile, safety perception ($\beta = -0.09$; t-value = 1.49) has a significant negative impact on safety compliance behavior, rejected H1e. Moreover, safety knowledge ($\beta = 1.68$; t-value = 0.11) and safety commitment ($\beta = 0.12$; t-value = 0.14) do not have any relations with safety compliance behavior, rejected two other hypotheses H1c and H1g respectively.

On the other hand, standardized path coefficients (β) and t-values revealed that safety participation and involvement positively influenced by risk management ($\beta = 0.20$; t-value = 3.25); safety training ($\beta = 0.15$; t-value = 2.72); safety rules ($\beta = 0.60$; t-value = 1.43); safety supervision ($\beta = 0.10$; t-value = 4.78); safety environment ($\beta = 0.02$; t-value = 4.82) and safety communication ($\beta = 0.43$; t-value = 2.91), supported six hypotheses as assumed, H2a; H2b; H1d; H1f; H1i and H1j respectively. Meanwhile, safety knowledge ($\beta = 0.11$; t-value = 0.96); safety perception ($\beta = 1.91$; t-value = 0.13); safety commitment ($\beta = 0.11$; t-value = 0.25) and safety rewards ($\beta = -0.06$; t-value = 1.09) do not have any relations with employees' safety participation, rejected four hypotheses H2c; H2e; H2g and H2h respectively.

H2b	Safety Training	—————>	Safety Participation	0.15	2.72**	Supported
H2c	Safety knowledge	—————>	Safety Participation	0.07	0.96	Rejected
H2d	Safety Rules	—————>	Safety Participation	0.60	1.43*	Supported
H2e	Safety Perceptions	—————>	Safety Participation	1.91	0.13	Rejected
H2f	Safety Supervision	—————>	Safety Participation	0.10	4.78***	Supported
H2g	Safety Commitment	—————>	Safety Participation	0.11	0.25	Rejected
H2h	Safety Rewards	—————>	Safety Participation	-0.06	1.09	Rejected
H2i	Safety Environment	—————>	Safety Participation	0.02	4.82***	Supported
H2j	Safety Communication	—————>	Safety Participation	0.43	2.91**	Supported

*Absolute t-value > 1.96, p< 0.05; **Absolute t-value > 2.58, p< 0.01; ***Absolute t-value > 3.29, p< 0.001

5. Discussion and Implications

Hotels implement the safety culture strategy through dynamic tools whose measurements are determined by a model adapted from Kuo et al. (2020). This model consisted of 10 safe factors covering five variables: risk management; safety training; safety knowledge; safety rules; safety perceptions; safety supervision; safety commitment; safety rewards and punishment; safety environment; and safety communication.

On the one hand, the findings of this study revealed some criteria concerned with risk management factors that can impact employees' safe-behavior (i.e., safety compliance and safety participation) during crises. These criteria included "Risk investigation system; Hazard prevention; risk assessment of each department and management procedures for significant hazards". On the other hand, the study indicated that safety training constructs mainly in "providing sufficient resources to enforce employee safety training; understanding the Covid-19 hazard factors at work; safety training courses include operating procedures and equipment management". Besides, the research outcomes confirm the positive influence of these criteria, supporting model H1a; H1b; H2a and H2b. These findings are consistent with Rakowska and Szubielska (2013); Vierendeels et al., 2018 and Kuo et al. (2020) showed that employees have to comply with specialized safety training courses and risk assessment of Covid-19, when their work involves such unique hazards. Therefore, this study suggests that practical safety training and education program may be needed depending on the turn assigned to managers and supervisors through promoting good work practices. Moreover, managers may need additional safety training and risk assessment to ensure that they can fulfill their roles in providing direction for the hotel safety program.

Furthermore, the study mentioned some significance towards safety rules construct "employees comply with the standard operating procedures and codes of safety practice; performing unfamiliar tasks;

complying with safety procedures when directors are off-site". The results confirm the positive influence of these significant employees' safe behavior during the crisis of Covid-19, supporting models H1d and H2d. This is consistent with a previous study of Manduku (2015) which emphasized the importance of the fact that employees should be aware of a number of specific rules in the hotel safety program and implementing it in their daily work activities. Therefore, the study suggests that there must be a brochure of the unique safety rules that employees must abide by, in addition to publishing these rules on a daily basis in all departments of the hotel to oblige employees to read and act upon them.

With regards to safety supervision, the study indicated that some items had significant effects on employees' safe behavior like "Hotel directors promote the safety rules, supervise and care about the employees at the workplace; paying lots of attention to occupational safety of the new employees; prioritizing safety when operation performance conflicts with safety". These findings are consistent with Glendon et al. (2016) and Srivastava (2017) when they indicated that safety supervision plays a crucial role in reducing workplace injuries. Moreover, safety supervision is a legal responsibility under occupational health and safety laws.

Further, the results indicated that there are some items that had significant effects concerning the safety environment during the crisis of Covid-19, supporting model H1i and H2i. These items are "providing protective instruments/tools such as gloves, alcoholic spray, medical muzzle; first-aid training courses; maintenance and sterilization schedule of equipment periodically". Consistent with Labor Law Clinic (2015), it confirmed that because the risk-laden work environment may not be avoidable, hotel managers must prepare protective tools in appropriate numbers, design a maintenance program, and suitable training and practice to maintain safety at the workplace.

Concerning the safety communication factor, the study identified some considerations which may affect

employees' safe behavior during the covid-19 crisis with regards to "rehearsing emergency responses; maintaining a clean environment; advocating relevant work laws, regulations, and specifications to Covid-19; discussing operation safety problems". These findings support both H1j and H2j and are similar to the study of Rakowska & Szubielska (2013) and Vierendeels et al. (2018). A picture shows that employee safety should be a top priority in any organization. Moreover, employees who are injured/infected can request financial compensations from hotels if they are exposed to the Coronavirus. Hence, it is essential that managers and supervisors effectively announce and enforce safety standards to every employee in the hotel. Therefore, the study suggests that managers and supervisors should encourage employees to develop health and safety programs within the hotel. Also, managers can create custom templates for employees to add their opinions regarding the safety programs and express any other suggestions.

Safety rewards and punishment factor proved in this study that it had a significant effect on only employees' safety compliance, supporting H1h. Employees mostly agreed that "hotel directors set clear safety reward-and-punishment procedures; promoting safety performance through safety reward measures; evaluating employees' safety attitude periodically" are the most critical items that enable employees to perform compliance. However, this factor does not affect employees' safety participation and rejects H2h. These findings differ from those by Kuo et al. (2020), which found that emotional feedback, financial incentives, social recognition as a rewarding safety system have a positive impact upon employee safety participation. These results confirmed that employees only comply with safety procedures for fear of punishment, without the slightest benefit from participating in safety activities.

Finally, regarding factors of "safety knowledge; safety perception; and safety commitment", they were less accepted by the employees' safe behavior. The research outcomes confirm that there was no significant relationship between these safety culture factors and hotel employees' safe-behavior during the crisis of Covid-19. These findings differ from those by Ostrom et al. (1993); Berends (1995); Lee (1996); Lee and Harrison (2000); O'Toole (2002); Havold (2005); Grecco et al. (2014); Wang and Sun (2014); Warszawska and Kraslawski (2016) and Vierendeels et al. (2018) which found that employees' safety knowledge, perception, attitude and commitment

appear to influence employees' decisions that are related to at-risk behaviors and decisions on the job. Hence, this study suggests that during the Covid-19 pandemic, hotel management should focus on how to best leverage these dimensions in the future to lay a more positive impact upon injury rates within their workplace.

6. Limitation and Future Research

To accomplish this research successfully, this study comprises several limitations. The first one is related to methodology limitations. This study used only a self-reported questionnaire survey. Interviews and focus group instruments could utilize a broader range of hotel employees. Second, the current study investigated a sample of employees in several Egyptian hotels, as a total population cannot be accessed. Finally, this research measured the influence of 10 independent variables on two dependent variables. Therefore, future research could include moderator variables to improve the validity of the study.

References

- Arbuckle, J. (2011). *IMB SPSS AMOS 20 User's Guide*. AMOS Development Corporation, Mount Pleasant, SC.
- Ayittei, F., Ayittei, M., Chiwero, N., Kamasah, J. and Dzuvor, C. (2020). Economic impacts of Wuhan 2019-nCoV ON China and the world. *Journal of Medical Virology*, 92, 473-475. Available from: <https://onlinelibrary.wiley.com/doi/epdf/10.1002/jmv.25706> (accessed on 06 June 2020).
- Berends, J. J. (1995). *Developing and using a widely applicable measurement tool for safety culture*, Unpublished interim report. Eindhoven: Eindhoven University of Technology.
- Chan, E. S., & Lam, D. (2013). Hotel safety and security systems: Bridging the gap between managers and guests. *International Journal of Hospitality Management*, 32, 202-216.
- Chen, M. H. (2011). The response of hotel performance to international tourism development and crisis events. *International Journal of Hospitality Management*, 30(1), 200-212.
- Chinazzi, M., Davis, J., Ajelli, M., Gioannini, C., Litvinova, M., Merler, S., Piontti, A., Mu, K., Rossi, L., Sun, K., Viboud, C., Xiong, X., Yu, H., Halloran, E., Longini Jr, I. and Vespignani, A. (2020). The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak, *Science*, 368, 395-400, available at: <https://science.sciencemag.org/content/sci/368/6489/395.full.pdf> (Accessed 15 June 2020).

- Chinda, T. (2014). Organizational factors affecting safety implementation in food companies in Thailand. *International journal of occupational safety and ergonomics*, 20(2), 213-225.
- Cooper, D. (2001). *Improving safety culture: A practical guide*. Wiley & Sons Ltd.
- Courtney, E.J. (2020). COVID-19 will cause a significant decline in global RevPAR, cash flow, for rated lodging companies. available at: www.spglobal.com/ratings/en/research/articles/200311-covid-19-will-cause-a-significant-decline-in-global-revpar-cash-flow-for-rated-lodging-companies-11382396#ID493
- DaRos, J. (2011). *Preventing workplace injuries commonly sustained by hotel guestroom attendants*. Master's thesis (Available from UNLV Theses, Dissertations, Professional Papers, and Capstones).
- Easter, K., Hegney, R., & Taylor, G. (2004). Enhancing Occupational Health & Safety.
- Estrada, M., Park, D. & Lee, M. (2020). How A Massive Contagious Infectious Diseases Can Affect Tourism, International Trade, Air Transportation, and Electricity Consumption? The Case of 2019 Novel Coronavirus (2019-nCoV) in China. February 19. Available at SSRN Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3540667 (Access on 24 June 2020)
- Fell-Carlson, D. (2004). Rewarding safe behavior: strategies for change. *Accident Analysis and Prevention*, 38(2), 521-529.
- Fleming, M., & Lardner, R. (1999). Safety culture: the way forward. *Chemical engineer*, 676, 16-18.
- Gander, P., Hartley, L., Powell, D., Cabon, P., Hitchcock, E., Mills, A., & Popkin, S. (2011). Fatigue risk management: Organizational factors at the regulatory and industry/company level. *Accident Analysis & Prevention*, 43(2), 573-590.
- Glendon, A. I., Clarke, S., & McKenna, E. (2016). *Human safety and risk management*. Crc Press.
- Grecco, C. H., Vidal, M. C. R., Cosenza, C. A. N., dos Santos, I. J. A. L., & de Carvalho, P. V. R. (2014). Safety culture assessment: A fuzzy model for improving safety performance in a radioactive installation. *Progress in Nuclear Energy*, 70, 71-83.
- Griffin, M. A., & Neal, A. (2000). Perceptions of safety at work: a framework for linking safety climate to safety performance, knowledge, and motivation. *Journal of occupational health psychology*, 5(3), 347.
- Gu, H., & Wall, G. (2006). The effect of SARS on China's tourism enterprises. *Tourism*, 54 (3), 225-234.
- Guevara, G. 2020. "Open letter from WTTC to governments", available at: <https://www.wttc.org/about/media-centre/press-releases/press-releases/2020/open-letter-from-wttc-to-governments>
- Gyekye, S. A. (2006). Workers' perceptions of workplace safety: An African perspective. *International journal of occupational safety and ergonomics*, 12(1), 31-42.
- Hair, J. F., Jr., Black, J. W., Babin, B. J., & Anderson, E. R. (2010). *Multivariate data analysis*. (7th ed.). Essex, UK: Pearson Education Limited.
- Håvold, J. I. (2005). Safety-culture in a Norwegian shipping company. *Journal of safety research*, 36(5), 441-458.
- Hilliard, T. W. (2009) *Crisis prepared meetings: Crisis preparedness program components and factors influencing adoption by meeting planners*. PhD thesis, Oklahoma State University: USA.
- Hofmann, D. A., Burke, M. J., & Zohar, D. (2017). 100 years of occupational safety research: From basic protections and work analysis to a multilevel view of workplace safety and risk. *Journal of applied psychology*, 102(3), 375.
- Hoisington, A. (2020). 5 Insights about how the COVID-19 pandemic will affect hotels", available at: www.hotelmanagement.net/own/roundup-5-insights-about-how-covid-19-pandemic-will-affect-hotels
- Hung, K. K., Mark, C. K., Yeung, M. P., Chan, E. Y., & Graham, C. A. (2018). The role of the hotel industry in the response to emerging epidemics: a case study of SARS in 2003 and H1N1 swine flu in 2009 in Hong Kong. *Globalization and health*, 14(1), 117.
- ILO, (2020). COVID-19 and world of work: impacts and responses. International Labour Organization (ILO) Note, March 18. Available from: (https://www.ilo.org/wcmsp5/groups/public/dgreports/dcomm/documents/briefingnote/wcms_738753.pdf). (Accessed on 07 June 2020).
- International Atomic Energy Agency (1991). *Safety culture: A report by the international nuclear safety advisory group*. Retrieved from https://www-pub.iaea.org/mtcd/publications/pdf/pub882_web.pdf.
- Issa, I. A., & Altinay, L. (2006). Impact of political instability on tourism planning and development: The case of Lebanon. *Tourism Economics*, 12 (3), 361-381.
- Kalteh, H. O., Mortazavi, S. B., Mohammadi, E., & Salesi, M. (2019). The relationship between safety culture and safety climate and safety performance: a systematic review. *International journal of occupational safety and ergonomics*, 1-11.
- Kapp, E. A. (2012). The influence of supervisor leadership practices and perceived group safety climate on employee safety performance. *Safety science*, 50(4), 1119-1124.
- Kuo, N. T., Cheng, Y. S., Chang, K. C., & Ying, W. H. (2020). Establishing a measurement scale for safety culture in the hotel industry. *Journal of Hospitality and Tourism Management*, 42, 12-28.
- Labor Law Clinic (2015). *Occupational health and safety for hotel housekeepers*. Retrieved from http://www.iuf.org/w/sites/default/files/Occupational_Health_and_Safety_Standards_for_Housekeepers.pdf.
- Lee, T. R. (1996). Perceptions, attitudes and behaviour: the vital elements of a safety culture. *Health and Safety*, 10, 1-15.
- Lee, T., & Harrison, K. (2000). Assessing safety culture in nuclear power stations. *Safety science*, 34(1-3), 61-97.

- Malhotra, R., & Venkatesh, U. (2009). Pre-crisis period planning: lessons for hospitality and tourism. *Worldwide Hospitality and Tourism Themes*, 1(1), 66-74.
- Manduku, F. M. (2015). *Extent of the implementation of the occupational safety and health act 2007 in the Sarova group of hotels in Nairobi* (Doctoral dissertation, University of Nairobi).
- Manning, L. (2018). The value of food safety culture to the hospitality industry. *Worldwide Hospitality and Tourism Themes*.
- Misiurek, K., & Misiurek, B. (2017). Methodology of improving occupational safety in the construction industry on the basis of the TWI program. *Safety science*, 92, 225-231.
- Mohammad, A. A. A. (2014). *Managing Demand for Hotel Establishments during Downturn Times and their Impact on Hotel Revenues: A Case Study of Cairo Hotels* (Doctoral dissertation, School of Management, Cardiff Metropolitan University).
- Morrow, S. L., Koves, G. K., & Barnes, V. E. (2014). Exploring the relationship between safety culture and safety performance in US nuclear power operations. *Safety Science*, 69, 37-47.
- Ostrom, L., Wilhelmsen, C., & Kaplan, B. (1993). Assessing safety culture. *Nuclear safety*, 34(2), 163-172.
- O'Toole, M. (2002). The relationship between employees' perceptions of safety and organizational culture. *Journal of safety research*, 33(2), 231-243.
- Pallant, J. (2005). *SPSS survival manual: A step by step guide to data analysis using SPSS version 12*. Second edition. Berkshire: Open University Press.
- Paraskevas, A. (2013). Aligning strategy to threat: a baseline anti-terrorism strategy for hotels. *International Journal of Contemporary Hospitality Management*, 25(1), 140-162.
- Parnell, J. A., Koseoglu, M. A., & Spillan, J. E. (2010) Crisis readiness in Turkey and the United States. *Journal of Contingencies and Crisis Management*, 18(2), 108-116.
- Pidgeon, N. (1998). Safety culture: key theoretical issues. *Work & stress*, 12(3), 202-216.
- Racherla, P., & Hu, C. (2009). A framework for knowledge-based crisis management in the hospitality and tourism industry. *Cornell Hospitality Quarterly*, 50(4), 561-577.
- Rakowska, A., & Szubielska, J. (2013). Safety Culture Model and its Dimensions on the Example of Coal Mines in Poland. *Management knowledge and learning*, 19-21.
- Real, K. (2008). Information seeking and workplace safety: A field application of the risk perception attitude framework. *Journal of Applied Communication Research*, 36(3), 339-359.
- Reid, R. D., & Bojanic, D. C. (2009). *Hospitality marketing management*. John Wiley and Sons.
- Ritchie, W. B. (2009). *Crisis and disaster management for tourism*. UK; Channel View Publications.
- Runyoro, V. A., & Kideghesho, J. R. (2010). Coping with the effects of global economic recession on tourism industry in Tanzania: are we prepared. *Journal of Tourism Challenges and Trends*, 3(1), 95-110.
- Senya, E. K. (2017). Assessing the Awareness of Safety Rules in the Hospitality Industry in Ghana: A Case of Some Selected Hotels in the Accra Metropolitan Area.
- Silbey, S. S. (2009). Taming Prometheus: Talk about safety and culture. *Annual Review of Sociology*, 35, 341-369.
- Smith, K. (1995) *Environmental hazards: Assessing risk and reducing disaster*. London: Routledge.
- Sönmez, S., Apostolopoulos, Y., Lemke, M. K., Hsieh, Y. C. J., & Karwowski, W. (2017). Complexity of occupational health in the hospitality industry: dynamic simulation modeling to advance immigrant worker health. *International Journal of Hospitality Management*, 67, 95-105.
- Specht, A. (2006). Natural disaster management. In: Wilks, J., Pendergast, D., & Leggat, P. (Eds.) *Tourism in turbulent times: Towards safe experience for visitors*. UK: Elsevier.
- Srivastava, M. (2017). Potential health hazards of workers in hospitality industry. *International Journal of Applied Home Science*, 4(7-8), 617-622.
- Suhanyiova, L., Flin, R., & Irwin, A. (2016). Safety systems in product safety culture. *Risk, Reliability and Safety: Innovating Theory and Practice: Proceedings of ESREL*, 1803-8.
- Sukadarin, E. H., Suhaimi, N. S., & Abdull, N. (2012). Preliminary study of the safety culture in a manufacturing industry. *International Journal of Humanities and Social Science*, 2(4), 176-183.
- Tam, V. W., & Fung, I. W. (2012). Behavior, attitude, and perception toward safety culture from mandatory safety training course. *Journal of Professional Issues in Engineering Education and Practice*, 138(3), 207-213.
- Tarlow, P. (2014). *Tourism security: strategies for effectively managing travel risk and safety*. Elsevier.
- Tew, P. J., Lu, Z., Tolomiczenko, G., & Gellatly, J. (2008). SARS: lessons in strategic planning for hoteliers and destination marketers. *International Journal of Contemporary Hospitality Management*, 20 (3), 332-346.
- The State of Queensland (2013). Understanding safety culture. Retrieved from https://www.worksafe.qld.gov.au/data/assets/pdf_file/0004/82705/understanding-safetyculture.pdf.
- Tsai, C.-S. (2004). DMAIC safety culture model applied to hi-tech enterprises (Unpublished master's thesis) Tainan: National Cheng Kung University.
- Tsaur, S. H., & Tang, Y. Y. (2012). Job stress and well-being of female employees in hospitality: The role of regulatory leisure coping styles. *International Journal of Hospitality Management*, 31(4), 1038-1044.

- UNWTO (2020), "An inclusive response for vulnerable groups", available at: www.unwto.org/covid-19-inclusive-response-vulnerable-groups (accessed 27 June 2020).
- Vierendeels, G., Reniers, G., van Nunen, K., & Ponnet, K. (2018). An integrative conceptual framework for safety culture: The Egg Aggregated Model (TEAM) of safety culture. *Safety science*, 103, 323-339.
- Wang, L., & SUN, R. (2014). A new safety culture measurement tool and its application. *International Journal of Safety and Security Engineering*, 4(1), 77-86.
- Warszawska, K., & Kraslawski, A. (2016). Method for quantitative assessment of safety culture. *Journal of Loss Prevention in the Process Industries*, 42, 27-34.
- Widerszal-Bazyl, M., & Warszawska-Makuch, M. (2008). Employee direct participation in organisational decisions and workplace safety. *International journal of occupational safety and ergonomics*, 14(4), 367-378.
- Wilder-Smith, A. (2006). Tourism and SARS. In: Wilks, J., Pendergast, D. & Leggat, P. (Eds). *Tourism in turbulent times: Towards safe experience for visitors*. UK: Elsevier.
- Williamson, A. M., Feyer, A. M., Cairns, D., & Biancotti, D. (1997). The development of a measure of safety climate: the role of safety perceptions and attitudes. *Safety Science*, 25(1-3), 15-27.
- Zhou, Z., Goh, Y. M., & Li, Q. (2015). Overview and analysis of safety management studies in the construction industry. *Safety Science*, 72, 337-350.