



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

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### 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 mitigating crises caused by nature in the workplace. This study investigates the influence of hotel safety culture on employees' safe behaviour during the crisis of Covid-19 to recommend some practices and allow those 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 behaviour. 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 analyse 257 questionnaire forms collected from employees. The study results depict that 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 behaviour during the crisis of COVID-19.

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### 1. Introduction

Covid-19 is an acronym for Corona Virus 2019, a septic infection disease that causes 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

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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 faces 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 the 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 with crisis challenges (Chen, 2011; Chan & Lam, 2013). One of these measures is related to employees' awareness of work safety through establishing a workplace safety culture (Manning, 2018).

Several studies into work safety have focused on accident rates in 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 the 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 behaviour 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 to represent 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 for 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 of this decade. COVID-19 has first 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 thousand 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

A crisis can be defined as an unpredictable high-impact event and a low probability that seriously threatens the organization and is 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 their 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 threatening 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 for this research paper is Malhotra and Venkatesh's (2009) model. Malhotra and Venkatesh (2009) developed a two-phase model including proactive and reactive response 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 the proactive responses stage, hotel managers should involve planning and prepare for unforeseen events by 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 practised 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 behaviour. Morrow et al. (2014) added that institutions that implement a 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 its 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 a 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

behavioural factors. These categories form a single bloc. Hence, to establish a safe workplace, these categories have to be carried on.

#### 2.4 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 and safety culture (Rakowska & Szubielska, 2013). Furthermore, establishing a safety culture can be an effective risk management approach. Through the measurement, diagnosis, and modification of the safety culture, risk assessment allows managers to improve their safety performance (Kalteh 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).

#### 2.5. Safety Psychology

Employees' psychological factor is a hidden state from knowledge, rules, abilities, and individual perception, so psychology surveys are required to confirm individuals' safety values. Drawing on the aforementioned 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's safety program by

carrying out assigned safety and health responsibilities in 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).

#### 2.6 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 & Warszevska-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 particular safety culture by 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 changes for their employees (Fell-Carlson, 2004). A safety rewarding system will have an evident positive influence on employee behaviours through emotional feedback, financial incentives, social recognition ...etc (Kuo et al., 2020).

#### 2.7 Safety Environment and Communication

For a hazard-less working environment, a safety management system must be established. High fatality and injury rates in the 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 mentioned above by 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 in the workplace (Glendon *et al.*, 2016). Moreover, management should improve employees' knowledge about safety culture by noticing and responding to unsafe situations, thereby providing them with clear, safe behavioural standards (Wang & Sun, 2014; Kuo *et al.*, 2020). On the other hand, in terms of safety communication, it is essential that every manager has to listen to his 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).

### 2.8. Employees' Safe Related Behaviour

There have been many academic researchers in safety awareness and employee safety-related behaviour. 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 behaviour as a variety of activities that individuals undertake to protect themselves and maintain a safe workplace incorporating procedures for individuals to comply with established safety rules as well as ongoing employee behaviours 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 participating in volunteer safety committees. Griffin and Neal (2000, as well as Kapp (2012), have conceptualized a safe-related behaviour scale, focusing on both dimensions of safety compliance and safety participation. There is a big difference between both safety compliance and safety participation behaviour. Safety compliance behaviour 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 behaviour is the attitude of an individual that indirectly helps develop a safe work environment (Griffin & Neal, 2000; Wang & Sun, 2014).

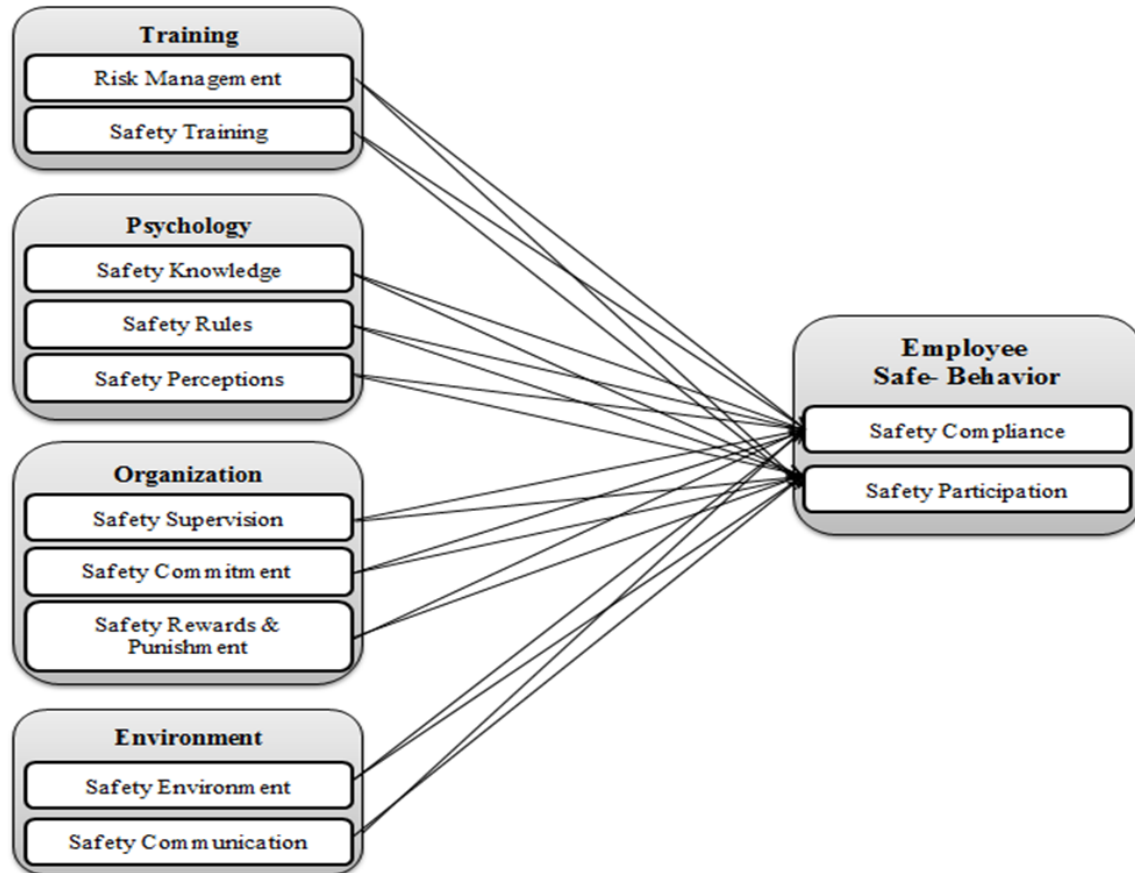
All in all, these safety culture tips can help managers to increase employees' safety awareness and establish a coherent safety message in the hotel, especially during this period of Covid-19. Establishing this culture may take some time for employees to learn and follow the rules, but these ideas, in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

- H1. Employees' safety compliance behaviour is 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 rewards and punishment have a positive impact on Employees' Safety Compliance.*

- H1i. A safe environment has a positive impact on Employees' Safety Compliance.
- H1j. Safety communication has a positive impact on Employees' Safety Compliance.
- H2. Employees' safety participation behaviour is 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 have 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. A safe 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-behaviour in hotels during the crisis of Covid-19



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

### 3. Methodology

Because the data-gathering tool was adapted and refined from prior investigations, this study used a paper-based survey (Kapp, 2012; Kuo et al., 2020). Table 1 lists the final questionnaire items as well as

their sources. Discussions with academics, hotel management, and ministry of tourism specialists helped to fine-tune the questionnaire. The questionnaire was pilot tested to assess the language, sequence, and length of the questions.

There were two sections in the final questionnaire form. In the first segment, employees were asked to rate 42 items on a seven-point Likert scale, in response to the question "To what extent do you agree or disagree with each statement?" Questions 1-4 assessed risk management construct, questions 5-8 assessed safety training, questions 9-11 assessed safety knowledge, questions 12-14 assessed safety rules, questions 15-19 assessed safety perceptions, questions 20-22 assessed safety supervision, 23-24 assessed safety commitment, questions 25-27 assessed safety rewards and punishment, questions 28-30 assessed safety environment, questions 31-34 assessed safety communication, questions 35-38 assessed safety compliance and questions 39-42 assessed safety participation of employee safe-behaviour. The second segment asked employees for their demographic

profiles (i.e., age, gender, education, working experience and job position).

The study's target group was five-star hotels personnel with a vested interest. As a result, convenience sampling was used. From May to August 2020, a paper-based survey was prepared and disseminated. Employees at five-star hotels were given 300 questionnaire forms in total. There were 257 valid surveys returned, yielding an 85.6 percent response rate.

SPSS version 20 was used for the descriptive analysis. On the other side, AMOS 4 was utilised to test the measurement model of safety culture and employees' safe behaviour using structural equation modelling (SEM). Furthermore, the SEM fit of the proposed model was assessed using goodness-of-fit methods. Table 1 lists the final questionnaire items1.

**Table 1**

Construct measurements

Construct	Code	Measure	Mean	Std. dev.
<b>Training (TT)</b>				
<b>Risk Management</b>	RM1	The hotel's incident report and investigation system is complete.	4.84	1.30
	RM2	The hotel is concerned about the training needs and its effects.	5.57	1.14
	RM3	For major dangers, the hotel establishes hazard prevention, control, and management measures.	5.23	1.11
	RM4	Each department's operating environment is subjected to a risk assessment by the hotel.	5.19	1.15
<b>Safety Training</b>	ST1	Employee training is enforced by the hotel using suitable resources (such as human resources and budget).	5.90	0.93
	ST2	Employees have a better understanding of workplace hazards through safety training courses.	5.83	1.11
	ST3	Employees and directors communicate and interact through safety training classes.	5.61	1.07
	ST4	Operational processes, equipment management, and personnel safety are all part of the hotel safety management system.	5.81	0.93
<b>Psychology (PP)</b>				
<b>Safety Knowledge</b>	SK1	The hotel employees are aware of and understand the emergency protocols.	5.34	1.11
	SK2	The hotel employees are aware of the meaning of the term "safety culture."	5.27	1.14
	SK3	The hotel employees are proud of their adherence to health and safety regulations.	5.53	1.10
<b>Safety Rules</b>	SR1	The employees follow the hotels' standard operating procedures and safety guidelines.	5.64	1.09
	SR2	The employees are more wary when executing unknown activities.	5.62	1.03
	SR3	The employees follow the safety measures even if managers are off hotel.	5.60	1.11
<b>Safety Perceptions</b>	SP1	The employees maintain a high level of alertness during working hours	4.71	1.41
	SP2	The employees are aware of the scope of their operation's safety measures.	5.57	1.14
	SP3	The importance of the industrial safety department in the hotel is recognised.	5.08	1.38
	SP4	The employees are aware of how to keep themselves safe at work.	3.84	1.71
	SP5	The employees cooperate with the directors' corrections of risky behaviours.	4.82	1.37

Construct	Code	Measure	Mean	Std. dev.
<b>Organization (OO)</b>				
<b>Safety Supervision</b>	SS1	The hotel managers frequently advocate safety regulations and supervise and care for their staff at the work.	5.71	0.84
	SS2	The hotel managers pay close attention to the new workers' occupational safety.	5.33	0.95
	SS3	The hotel managers consider safety foremost when operation performance and safety are at odds.	5.82	0.89
<b>Safety Commitment</b>	SC1	The hotel inspects fire-fighting apparatus, machinery, and equipment on a regular basis.	5.85	1.86
	SC2	The hotel emphasises the need of completing our responsibilities in a safe manner.	5.64	1.90
<b>Safety Rewards and Punishment</b>	SRP1	The hotel establishes explicit reward and punishment mechanisms for safety.	4.66	0.95
	SRP2	The hotel's safety incentive programmes are beneficial in encouraging safe behaviour.	4.95	0.81
	SRP3	The hotel managers assess the staff' safety attitudes on a regular basis in order to enhance it.	5.06	1.03
<b>Environment (EE)</b>				
<b>Safety Environment</b>	SE1	Gloves, alcoholic spray, and medical muzzles are among the protective instruments/tools provided by the hotel.	5.96	1.66
	SE2	Training courses for first-aid staff are held at the hotel on a regular basis.	5.33	1.84
	SE3	The hotel's equipment is serviced on a regular basis.	5.72	1.04
<b>Safety Communication</b>	SCO1	All hotel employees are required to practice emergency responses.	6.20	1.88
	SCO2	The hotel maintains a clean and orderly workplace.	5.94	1.52
	SCO3	The hotel is a strong supporter of relevant labor laws, regulations, and standards.	5.83	1.09
	SCO4	The employees discuss operational safety issues with co-workers and directors on a regular basis.	6.31	0.97
<b>Employees' Safe-Behaviour</b>				
<b>Safety Compliance</b>	SCM1	I follow protective practises when handling dangerous products.	5.88	1.82
	SCM2	I put on the appropriate personal protective equipment for the job.	5.43	1.80
	SCM3	I report dangerous behaviour by coworkers to the managers.	4.68	1.52
	SCM4	When my work puts me in danger, I put safety first.	5.91	1.48
<b>Safety Participation</b>	SPA1	I am willing to help with tasks that are related to safety.	6.22	1.92
	SPA2	I frequently participate in the formulation of my job's safety standards.	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 analyse the factors influencing hotel employees' safe behaviour 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 shown in Table (1). Table (1) shows that employees were primarily committed to hotel safety culture, as follows: " The employees discuss operational safety issues with co-workers and directors on a regular basis" (M = 6.31); "All hotel employees are required to practice emergency responses" (M = 6.20); " Gloves, alcoholic spray, and medical muzzles are among the protective instruments/tools provided by the hotel " (M = 5.96); "The hotel maintains a clean and orderly workplace"

(M = 5.94); "Employee training is enforced by the hotel using suitable resources (such as human resources and budget)" (M = 5.90); "The hotel inspects fire-fighting apparatus, machinery, and equipment on a regular basis." (M = 5.85). However, the employees disagreed with safety perceptions as "The employees know how to protect their safety at work" (M = 3.84).

### 3.1 Data Analysis

Using the Analysis of Moment Structure, the structural Equation Modelling (SEM) technique was used (AMOS). AMOS stands for analysis of moment structures. It's an SPSS module that's used for Structural Equation Modeling, Path Analysis, and Confirmatory Factor Analysis. It's also known as



causal modelling software or analysis of covariance software. First, Confirmatory Factor Analysis (CFA) was used to track the safety culture behaviour assessment model. Second, Cronbach's alpha and composite reliability (CR) were used to assess the constructs' reliability.

#### 4. Results and Discussion

##### 4.1. Personal Profile

This study investigated employees' safe-behaviour during the crisis of Covid-19. Surveys of 300 employees were sent out. Among the questionnaires returned, 257 were usable ones, resulting in an 85.6 percent response rate. Table 2 shows the demographics of the employees who participated in this research. There were 60.7 percent males and

39.3% females among the 257 employees who took part in the survey. 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.

Profile of respondents (N=207)

Demographic Data		Frequency	%
<b>Age</b>	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
<b>Gender</b>	Male	156	60.7
	Female	101	39.3
<b>Education</b>	Primary	4	1.5
	Secondary	60	23.3
	University	155	60.3
	Post	38	14.7
<b>Time worked in the hotel</b>	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
<b>Job Position</b>	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  $\alpha$  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 are aware of the scope of their operation's safety measures). 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’s  $\alpha$  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, at the 0.1 percent level, all of the parameter estimations'-values were statistically significant.

**Table 3**

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

<b>Construct</b>	<b>Factor Loading</b>	<b>CR</b>	<b>A</b>	<b>AVE</b>
<b>Risk Management</b>		<b>0.86</b>	<b>0.85</b>	<b>0.62</b>
SM1	0.63			
SM2	0.76			
SM3	0.90			
SM4	0.83			
<b>Safety Training</b>		<b>0.81</b>	<b>0.80</b>	<b>0.52</b>
ST1	0.74			
ST2	0.72			
ST3	0.69			
ST4	0.75			
<b>Safety knowledge</b>		<b>0.88</b>	<b>0.86</b>	<b>0.724</b>
SK1	0.79			
SK2	0.86			
SK3	0.88			
<b>Safety Rules</b>		<b>0.89</b>	<b>.88</b>	<b>0.738</b>
SR1	0.85			
SR2	0.86			
SR3	0.85			
<b>Safety Perceptions and Attitude</b>		<b>0.90</b>	<b>0.89</b>	<b>0.704</b>
PAS1	0.81			
PAS2	0.87			
PAS3	0.83			
PAS5	0.83			
<b>Safety Supervision</b>		<b>0.85</b>	<b>0.83</b>	<b>0.667</b>
SS1	0.61			
SS2	0.83			
SS3	0.96			
<b>Safety Commitment</b>		<b>0.73</b>	<b>0.70</b>	<b>0.577</b>
SC1	0.71			
SC2	0.79			
<b>Safety Rewards and Punishment</b>		<b>0.85</b>	<b>0.83</b>	<b>0.665</b>
SRP1	0.85			
SRP2	0.90			
SRP3	0.66			
<b>Safety Environment</b>		<b>0.79</b>	<b>0.80</b>	<b>0.581</b>
SE1	0.63			
SE2	0.63			
SE3	0.97			
<b>Safety Communication</b>		<b>0.89</b>	<b>0.86</b>	<b>0.673</b>
SCO1	0.83			
SCO2	0.85			
SCO3	0.66			

SCO4	0.92			
Safety Compliance		<b>0.85</b>	<b>0.84</b>	<b>0.602</b>
SCM1	0.84			
SCM2	0.87			
SCM3	0.78			
SCM4	0.58			
Safety Participation		<b>0.91</b>	<b>0.89</b>	<b>0.721</b>
SPA1	0.86			
SPA2	0.88			
SPA3	0.71			
SPA4	0.93			

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

4.2.2. Structural model and Hypotheses testing

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 behaviour, 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 behaviour, rejected two other hypotheses H1c and H1g respectively.

On the other hand, standardized path coefficients ( $\beta$ ) 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.

Table 4

Standardized parameter estimates of the structural model.

H	Path	Beta coefficients ( $\beta$ )	t-values	Results
H1a	Risk Management → Safety Compliance	1.91	0.13*	Supported
H1b	Safety Training → Safety Compliance	<b>0.34</b>	<b>4.81***</b>	Supported
H1c	Safety knowledge → Safety Compliance	1.68	0.11	Rejected
H1d	Safety Rules → Safety Compliance	<b>0.29</b>	<b>3.28**</b>	Supported
H1e	Safety Perceptions → Safety Compliance	-0.09	1.49*	Rejected
H1f	Safety Supervision → Safety Compliance	<b>0.28</b>	<b>2.65**</b>	Supported
H1g	Safety Commitment → Safety Compliance	0.12	0.14	Rejected
H1h	Safety Rewards → Safety Compliance	<b>0.32</b>	<b>2.99**</b>	Supported
H1i	Safety Environment → Safety Compliance	<b>0.52</b>	<b>3.74***</b>	Supported
H1j	Safety Communication → Safety Compliance	<b>0.56</b>	<b>5.34***</b>	Supported
H2a	Risk Management → Safety Participation	<b>0.20</b>	<b>3.25**</b>	Supported
H2b	Safety Training → Safety Participation	<b>0.15</b>	<b>2.72**</b>	Supported
H2c	Safety knowledge → Safety Participation	0.07	0.96	Rejected
H2d	Safety Rules → Safety Participation	<b>0.60</b>	<b>1.43*</b>	Supported
H2e	Safety Perceptions → Safety Participation	1.91	0.13	Rejected
H2f	Safety Supervision → Safety Participation	<b>0.10</b>	<b>4.78***</b>	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	<b>0.02</b>	<b>4.82***</b>	Supported
H2j	Safety Communication → Safety Participation	<b>0.43</b>	<b>2.91**</b>	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; a safe 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 behaviour (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 models 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 fulfil their roles in providing direction for the hotel safety program.

Furthermore, the study mentioned some significance of 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 behaviour during the crisis of Covid-19, supporting models H1d and H2d. This is consistent with a previous study by 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 implement 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 behaviour 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) who 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 on the safety environment during the crisis of Covid-19, supporting models 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 behaviour 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 compensation 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, and social recognition as a rewarding safety system have a positive impact on 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 behaviour. The research outcomes confirm that there was no significant relationship between these safety culture factors and hotel employees' safe behaviour 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 behaviours 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 on 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.

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