

DEVELOP ORGANIZATIONAL HEALTH AND SAFETY MODEL OF ABU DHABI POLICE USING STRUCTURE EQUATION MODEL

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Abstract

Health and safety is critical in all industries, but it is especially important in the police force. It really is a big concern because it is one of the most vulnerable fields when it comes to workplace incidents. Because of the unusual and risky existence of the police force, safety and health have always been a major concern. It's harder to decipher because there aren't any universally accepted health and safety systems in policing, and there's a lot of unpleasant publications. Therefore, the aim of this study was to develop organizational health and safety model of Abu Dhabi police. In this research, the populations are staff members of health and safety department in police sector in the (UAE). As a result, a total of 285 completed questionnaires were returned. There were 19 defective questionnaire sets, which were deemed invalid and unsuitable for further study, while the other 266 survey sets were deemed valid for further analysis. The analysis of data using appropriate statistical techniques statistical package for social sciences (SPSS) and structural equation modelling (SEM) as the research is quantitative in nature. According to the results of this analysis, personnel are the primary cause of injuries, but management is responsible for preventing hazardous situations. As a practice, reflecting on the often difficult lessons of the past will help to ensure a safer future. As a result, remedies to health and safety issues in one country can easily be transferred to other nations, resulting in even greater improvements. The policy implication of the research is to awaken government in general and ministry of interior in particular from the slumber of implementation of reliable approach to tackle accidents and criminals.

KeyWords: Health & Safety, Performance Framweork, Abu Dhabi, Police Sector, Safe Future

1. Introduction

As the world has become smaller through technology and through cooperative arrangements that cross many borders; the issue of the police sector's health and safety has become a well-recognized problem and represents a concern that is shared worldwide (Iversen et al., 2018). Even though the mechanization of the police sector is not uniform throughout the world especially in the developing

countries, high accidents and fatalities rates are vastly different to developed regions. This is due, in part to the minimum use of equipment, shortages of adequately craftsmen, difficulty in acquiring needed materials, and lack of adequate infrastructure and other facilities (Dunlop et al., 2016). Furthermore, there are many other obstacles to the achievement of good standards such as pressure of production or performance targets, and the complexity of the

organisation are typical examples of such obstacles including the most crucial factor of cultural and behavioral aspects. Culture frames the ways in which we express ourselves (Center for Chemical Process Safety, 2016) and how we interpret the actions of others. People from different nationalities and ethnic groups express themselves and understand the behaviours of others in different ways, which are informed by specific sets of cultural knowledge and conventions. Thus cross-cultural misunderstandings occur which can lead to health and safety problems. Therefore a new approach to the management of health and safety is required (Martínez-Aires et al., 2016). Thus, it can be considered that the health and safety problems that exist in police sector are rarely unique to a single country and as the global community continues to shrink, it will benefit to share ideas and to learn from the lessons already experienced by others (Kongsvik et al., 2016). Since, in the global market, police sector's problems are very similar from country to country and this is quite evident when attending international health and safety conferences where the themes of primary interest have general appeal to all participants, police health and safety problems appear to be everywhere. Consequently, health and safety can be improved by addressing police problems in many different ways as it reflects the common threat that binds the global research efforts in police safety (Gambatese et al., 2017).

Although much research has been directed at health and safety, very little is concerned with the UAE and the particular characteristics of health and safety in their environment. A lack of awareness regarding the risks associated with specific occupational activities, coupled with poor adherence to health and safety procedures, partly explains the high incidence of occupational-related injuries in the UAE. A recent study investigating the knowledge and practices related to

occupational hazards among male cement workers ($n = 153$) in the Emirate of Ras Al Khaimah revealed that less than a third of workers reported using personal safety masks at all times during work (Keevil et al., 2017). Moreover, all cement workers reported that they had been provided with masks to protect them from dust; however, only 12% of workers reported that they were trained on how and when to use them. Similar studies conducted in the UAE have reported poor compliance with health and safety measures, including foundry, farm and cement factory workers failing to wear appropriate full-body, hand, foot, eye, ear and respiratory protection, resulting in impairments in visual acuity, hearing, lung function, and muscle function. These studies identify a prevalent situation in the UAE, that expatriate workers either: (i) lack awareness of the negative health consequences of specific occupational hazards; and/or (ii) have not been trained in, or do not perceive the benefits of, adhering to specific health and safety requirements, such as the use of appropriate personal protective equipment. The findings also provide support to the view that in most occupational settings, personal protective equipment should be a measure of last resort in the hierarchy of control measures for workplace hazards (Barnard et al., 2016). Therefore, this research aimed to develop new model of organizational health and safety in Abu Dhabi police.

2. Literature Review

2.1 Health and Safety in the Workplace

Health and safety in the workplace generally refers to occupational safety and health which is an area or field of science that basically promotes protection of health, safety and the total welfare of every human being as they do their respective work or job. It further applies to

employment as employees perform their assigned jobs which may also affect their co-workers or colleagues, other work departments, employers, clients, suppliers and their families as well (Ladou, 2006).

In UAE, there are actually two-tiered structure comprising of federal law on health and safety of workers. The Department of Municipal Affairs in Abu Dhabi has adopted a Code of Practice for Construction Projects which introduces new and significantly more detailed obligations in respect of construction site health and safety, including training, reporting procedures and the appointment of safety engineers (Shepherd, 2008).

During the first time of establishing UAE as a federal state and in spite of the lack of legislations and laws which organize the occupational safety and health in all fields, the federal government hospital started to implement good working conditions for the workers through introducing modern technology, instruments and procedures. Therefore, attention has been focused on creating positive business environment and adopting best practice methods. In UAE, the General Industrial Authority (local Agency), in co-operation with the Federal Environmental Agency, plays an important role in applying the international labour organizations (ILO) policies and procedures. In addition, the General Industrial Authority monitors and controls the municipalities and chambers of commerce & industry by forcing the companies to provide the workers with safe working conditions and supply them with necessary personal protective equipment. In summary, working conditions within UAE working sectors usually incorporate some health and safety policies and regulations, but how effective these policies and regulations are depending largely on training strategy, principles, and enforcement within the various working sectors.

2.2 Safety Climate

Safety climate is of current interest to construction practitioners and researchers. The concept of safety climate has been actively explored in the field of industrial and organizational psychology but is just gaining popularity in the construction industry (Lingard, 2011). A positive and strong safety culture is important for ensuring worker safety. For example if team members feel unable to speak freely about errors or risks they see, then this is likely to delay identification and action to reduce risks. As with organizational culture and safety culture no standard definition of safety climate exists.

Abu Dhabi government acknowledged the importance of establishing mechanisms to spread the culture of prevention and positive effects of the implementation of environment , occupational health and safety systems among all governmental and private entities in Abu Dhabi city, pointing out that the UAE is one of the first countries in the region that has paid great attention to the development and dissemination of the culture of occupational health and safety and to save the environment through many legislation and laws to integrate with the strategic objectives to achieve the UAE vision 2021.

However, Police officers play a pivotal role in Abu Dhabi UAE, they are involved in many aspects of Abu Dhabi UAE life. Officers' involvement ranges from general, daily, proactive patrol activities to specific criminal activities such as narcotic investigations. Because there is such a wide range of activities involved in police work, there are many health and safety issues surrounding policing as an occupation. Police officers may be exposed to different health and safety risks in their occupation. For example, police officers in Abu Dhabi are at risk of assault and homicide; the dynamics of policing as an occupation

creates opportunities for them to experience many psychosocial hazards such as stress, suicide, sexual harassment, and discrimination as well as ergonomic issues (Gambatese et al., 2017). It is important that research be completed on the health and safety issues of police officers in order to identify hazards and identify ways to reduce risk. The failure to identify and solve health and safety concerns of officers has potentially serious consequences for the health and wellbeing of officers and their families. These consequences can include depression, divorce, suicide, and disease. Not addressing the health and safety issues associated with policing may also impact the general public (Dunlop et al., 2016). For example, if an officer is stressed or fatigued, he/she may not perform his/her duties to the best of his/her ability reducing the contribution of policing to the community. Police officer fatigue might also increase the potential for a car accident, thus putting the public at risk.

2.3 Management Commitment

It is evident that management plays a very important role in an efficient and effective safety program. Rajaprasad & Chalapathi (2015), management must fully and actively translate ideas into safety actions, including issuing a written comprehensive safety policy, allocating sufficient resources, promptly reacting to safety suggestions and complaints, attending regular safety meetings and training, regularly visiting the workplace following the same safety rules as others.

2.4 Employees Participation

Successfully safety programs largely depend on employee involvement as workers tend to support the activities that they themselves help to create. Workers should be given opportunities to provide input into the design and implementation

of safety programs such as being a member of the safety committee, reporting hazards and unsafe practices to supervisors and identifying training needs, investigating an accidents (Machfudiyanto & Latief, 2019).

2.5 Training and Education

A successful safety program can be achieved if all employees are given periodic educational and training programs in order to improve their knowledge and skills on safety at work (Medeiros et al., 2011). Furthermore, The workplace must be carefully assessed to determine possible hazards on order for proper selection of safety equipment (World Health Organization, 2020). An effective safety program results in fewer injuries due to proper safety equipment acquisition and maintenance. Managing a safety equipment program takes up not only a large percentage of time for purchasing the correct equipment, maintaining them good condition, and inventory control, but it also requires a good cooperation amongst the safety manager/head purchasing, production, warehouse supervisor, maintenance manager (Reese, 2018)

2.6 Communication

When the lines or communications between management and workforce are open, workers can bring reports of unsafe working practices and hazardous environments to management's attention. Management in turn can communicate their concerns and priorities of safety to gain employee's compliance and awareness (Leveson et al, 2017). The goals of safety programs cannot be accomplished without adequate resources. An effective safety program results from the commitment of the top management to providing an appropriate level of resources. Management must consider and allocate sufficient resources to carry out day to day activities to accomplish both

short- term and long-term goals (Steiss, 2019). The resources required for effective safety program may include sufficient staff, time, money, information, methods used in safety works, facilities, machine, etc.

3. Organizational Culture as Mediator

The concept of safety culture has its origin in the concept of organizational culture (Pidgeon, & O’Leary et al., 2017). In order to understand what safety culture is, it is therefore important to understand the concept of organizational culture. The concept of organizational culture was truly developed during 1970s even though the ideas already existed earlier (Alvesson, 2018). Unfortunately, no standard definition of organizational culture has yet been developed and accepted. In fact, there is a controversy among scientists today whether organizational culture is something an organization is or something an organization has. The former view considers organizational culture as a way of describing the organization. This is often preferred by academics and social scientists. The latter view implies that culture is a variable that can be changed. This approach is often favoured by managers and management consultants (Davies, et al., 2000; NordénHågg, et al., 2010).

Reason (1997), defines organizational culture as “a shared values (what is important) and beliefs (how things work) that interact with an organizational structure and control systems to produce behavioural norms (the way we do things around here (Chatman, & O’Reilly, 2016). Fitria, (2018), defines organizational culture as “a concept often used to describe shared corporate values that affect and influence members’ attitudes and behaviours. Guldenmund (2010), presents a framework for safety culture which was based on Schein’s research and therefore

also partly based on Schein’s definition of organizational culture. Jespersen & Wallace (2017), defines organizational culture as “ a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think and feel in relation to those problems.

4. Research Methodology

This research purely quantitative method the questionnaire survey to assess the safety and health performance of police and govern authorities, and to evaluate the factors that affect the safety and health performance identified in the literature review. In this research, the populations are staff members of health and safety department in police sector in the (UAE). As a result, a total of 285 completed questionnaires were returned. There were 19 defective questionnaire sets, which were deemed invalid and unsuitable for further study, while the other 266 survey sets were deemed valid for further analysis. The analysis of data using appropriate statistical techniques statistical package for social sciences (SPSS) and structural equation modelling (SEM) as the research is quantitative in nature.

5. Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis is a more reliable factor analysis approach that analyzes if the measurements of a construct are consistent with the researcher's understanding of the nature of that construct (Awang, 2014). Indeed, Awang (2015) claimed that the CFA technique alleviated previous methods such as EFA in order to demonstrate the construction's validity.

Confirmatory Factor Analysis (CFA) is used in this study to confirm the impact of the constructs chosen from the literature review.. Inferentially, CFA aims to examine the relationship that may exist

between the observed variables under each hypothesized concept in order to quantitatively evaluate the quality of the factor structure, which would give more evidence of the construct validity of the new measurement.

Essentially, the use of SEM in conjunction with CFA for this research follows the standard steps recommended by leading scholars (Awang, 2015; Hair et al., 2011; Hooper et al., 2008), which are as follows: (1) model specification; (2) model identification; (3) parameter estimation;

(4) goodness-of-fit measurement; and (5) model re-specification..

To be more specific, the preliminary measure in this study analysis method is to evaluate the validity of the measurement model before evaluating the structural model. As a result, both measurement and structural models were assessed using the Maximum Likelihood method (ML). The goodness-of-fit indices and degree of acceptability in Table 4.6 were used as a reference in evaluating the fitness of construct measurement models and structural equation models.

Table 4.6: Goodness-of-fit index and level of acceptance

Name of category	Goodness-of-fit indices	Acceptance level	Comments	Literature support
Absolute fit	Chisq	$P > 0.05$	Sensitive to sample size greater than 200	Wheaton <i>et al.</i> , (1977)
Absolute fit	RMSEA	RMSEA < 0.08	Range 0.05 to 1.00 is acceptable	Brownne & Cudeck (1993)
Absolute fit	GFI	GFI > 0.90	GFI = 0.95 Is a good fit	Jorekog & Sorbom (1984)
Incremental fit	AGFI	AGFI > 0.90	AGFI = 0.95 Is a good fit	Tanaka & Huba (1985)
Incremental fit	CFI	CFI > 0.90	CFI = 0.95 Is a good fit	Bentler (1990)
Parsimonious fit	Chisq/df	Chisq/df < 5.0	The value should be less than 5.0	Marsh & Hocevar (1985)

Source: Adapted from Awang (2014; 2012)

In this study, re-specified models were evaluated before being utilized for further analysis, and Modification Indices (MI) were used as a guide to discover specification problems during the model re-specification process. As a result, confirmatory factor analysis of the measurement model's whole latent components in the research assessment framework were assessed and appropriately provided in the following sections. In addition, for each latent construct, initial measurement models, fitness indices, modification indices, and final measurement models were given

progressively. The goal was for readers to comprehend each stage of assessing the fitness of each measurement model in the research assessment model.

6. Convergent validity analysis

Convergent validity is defined as the factor loading scores from measurement scale items in a latent concept that are associated and significant. These items are expected to assess the same concept, and if their factor loading scores are larger than 0.5, the convergent criterion is met (Awang, 2014; 2015).

In this study, factor loading for all items in the final measurement model and

the Bentler-Bonett coefficient (NFI) are utilized to evaluate convergent validity (Hair et al., 2011). As previously stated, the items and NFI values of the final measurement models were both more than

0.5 and 0.9. Table 1, is included here to provide a summary. Based on the above in all measurement models of each construct, convergent validity for all constructs in this study met the acceptable criteria..

Table 1: convergent reliability

Constructs	CR	AVE
Management Commitment	0.982	0.741
Employees Participation	0.982	0.741
Training and Education	0.982	0.741
Communication	0.890	0.852
Face saving culture	0.743	0.654
Organizational Culture	0.823	0.721
Safety Climate	0.974	0.629

7. Unidimensionality

In this work, construct validity was investigated by examining both convergent validity and discriminant validity for the structural model's fitness. Pallant (2020) investigates concept validity by studying its connection with other constructs, both related (convergent validity) and unrelated (discriminant validity). According to Hair et al. (2017), the average variance extracted (AVE) should be greater than 0.5 to indicate acceptable convergent validity, while AVE estimations for two variables should be greater than 0.5 to give support for discriminant validity (Hair, et al., 2017) . According to Fornell and Larcker (1981), discriminant validity is met if the AVE is greater than the square of the correlation coefficient between the constructs. Furthermore, internal reliability (Cronbach's alpha), construct validity (CR), and average variance extracted are used to measure reliability (AVE).

The criterion of unidimensionality was met by using a low factor loading item-deletion procedure in the corresponding latent constructs. It was guaranteed that all items in the measurement models had factor

loadings larger than the required threshold of 0.6. Awang (2016).

8. Analysis for structural equation modeling

After determining the unidimensionality, reliability, and validity of the study constructs, the next stage of analysis is to combine all of the constructs into a single structural equation model using Analysis of Moment Structure (AMOS). The purpose of the pull out is to demonstrate the causal consequences of one construct on the other in accordance with the stated hypotheses..

The research assessment framework's exogenous and endogenous factors were organized. The configuration described with the exogenous variables intervening variable and the endogenous variable at the end. As shown in Figure 4.9, the relationship between each construct is denoted by an arrow pointing in the direction of the hypothesis. The model, on the other hand, was utilized to examine the multidirectional connections within the whole research components.

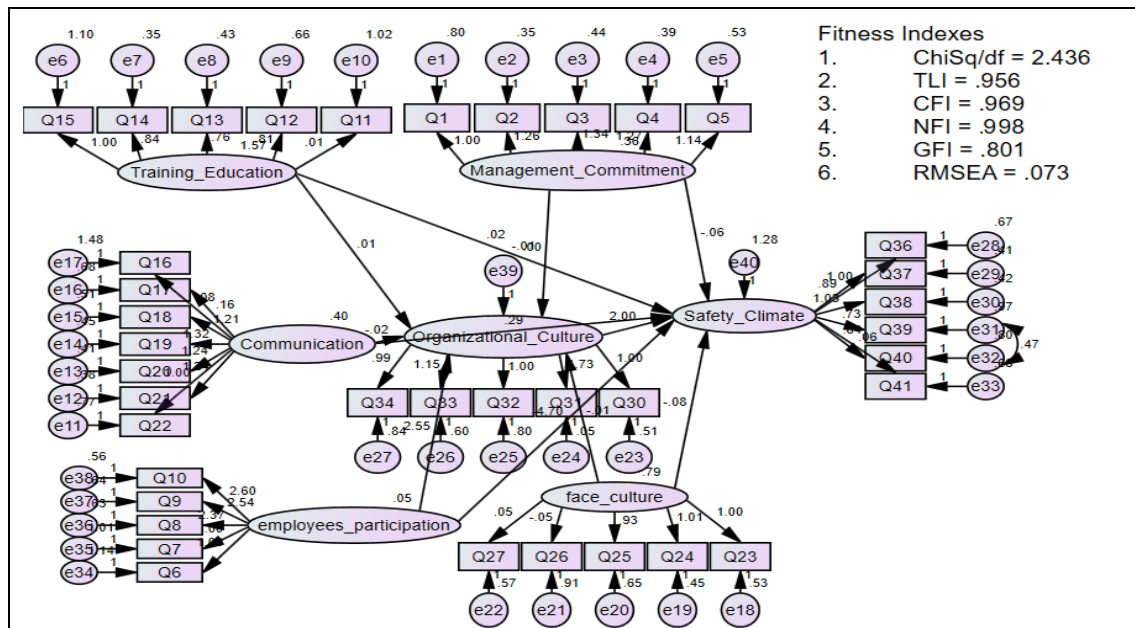


Figure 1: Structural measurement model for the entire research constructs and goodness-of-fitness for structural model

Certain fitness indexes for the structural measurement model, as shown in Figure 1 and Table 1, do not achieve the appropriate and needed level of goodness-of-fitness indexes (Awang, 2016). The observed factor loadings for the whole constructs were greater than 0.5, however fitness indices were lower than the required limit. As a result, modification indices were investigated in order to detect redundant elements, and they were correlated in order to enhance the model's goodness-of-fitness indexes.

Table 2: The Fitness Indices of structural model

Name of Index	Level of Acceptance	Index Value	Comments
Chisq/df	$\text{Chisq/df} \leq 3$	2.436	The required level is achieved
TLI	$\text{TLI} \geq 0.9$ means satisfactory	0.956	The required level is achieved
CFI	$\text{CFI} \geq 0.9$ means satisfactory fit.	0.969	The required level is achieved
NFI	$\text{NFI} \geq 0.80$ suggests a good fit	0.998	The required level is achieved
GFI	$\text{GFI} \geq 0.80$ suggests a good fit.	0.801	The required level is achieved
RMSEA	$\text{RMSEA} \leq 0.08$ mediocre fit.	0.073	The required level is achieved
Model is accepted			

In summary, the goodness-of-fitness for the two structural measuring models is shown in the figure, which shows the steady increase in the goodness-of-fitness indexes until an acceptable level is achieved. The final structural measurement model offered an examination of the causal effect (impact) for the path diagram's numerous components. First and foremost, the fitness indexes for the structural model were observed and satisfied within the stated acceptable level of goodness of fitness indexes, which represent how fit the hypothesized model is with the facts at hand (Awang, 2016 and Hair *et al.*, 2017).

The conventional regression weights showed the beta coefficient estimate, which reflects the effects of the major constructs; exogenous factors on the intervening variable and endogenous variables (Abu Dhabi Police Safety

Climate). The Analysis Moment of Structures (AMOS) model used in this study for structural equation modeling typically provided two types of text outputs: standardized regression weights and unstandardized regression weights for the route analysis. However, the standardized regression weight is used to describe the link between all components in the study theoretical framework and then for testing hypotheses in the research since it is better and simpler to comprehend (Awang, 2016).

9. Testing of research hypotheses

The extensive examination of literature aided the previously given hypothesised research model in chapter two'. The hypothesized outcome in Table 4.10 detailed the outcome of each respected path in the structural measurement model.

Table 3: The summary of the tested hypotheses in this research

S/N	The main hypothesis statement in the research		P-value	Result
1.	H1	H ₁ : There is a relationship between employee management commitment and Abu Dhabi Police safety climate	***	Supported
2.	H2	H ₂ : There is a relationship between employee participation and Abu Dhabi Police safety climate	***	Supported
3.	H3	H ₃ : There is a relationship between training and education and Abu Dhabi Police safety climate	***	Supported
4.	H4	H ₄ : There is a relationship between communication and Abu Dhabi Police safety climate	0.003	Supported

5.	H5	H ₅ : There is a mediating effects of organizational culture on the relationships between factors of organizational health and safety and Abu Dhabi police safety climate	***	Supported
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Key: *** represents P-value is less than 0.001

As a result, each path's hypothesis in this study is provided in the following paragraphs. Earlier, in chapters one and two, while outlining the issue statement of this research, it was indicated that the implications of organizational safety climate dimensions and Abu Dhabi Police Safety Climate. However, for the sake of this study, an in-depth examination of the effects of insignificant elements on the Abu Dhabi Police Safety Climate was accomplished and revealed. As a result of the foregoing, with regard to the relationship between the objectives of this study, the structural measurement model, and the hypotheses set for this study, it could be stated that, as it has been demonstrated that the proposed model can be used as a strategies improvement mechanism to improve Abu Dhabi Police Safety Climate by adopting Climate approach, which has been achieved by using strategies of this research, the study has provided proof that any effort.

10. CONCLUSION

The results obtained from the research data statistical analyses were presented in this chapter. The findings were based on the respondents responses (N = 266) in the surveyed respondents in UAE. The demographic backgrounds of the respondents were presented. Comprehensive analysis of the descriptive of every reliable in this research was

presented. In addition, outlined the computation of the scale refinement and data reduction analysis with the application SPSS version 22 for the exploratory factor analysis (EFA) and confirmation factor analysis (CFA) by the use of AMOS were adopted. Furthermore, the structural equation modelling analyses for all the constructs in this research were presented. Meanwhile, test of set research hypotheses were presented. In the end, concluding remarks were provided on the tested research hypotheses and details of the research findings, summary, recommendations and conclusion are discussed in the next and final chapter.

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