Examining Safety Culture among University Employees in Klang Valley

Nur Hairani Abd Rahman¹,*, Nurdaliela Razizi², Nurul Liyana Mohd Kamil¹

¹ Department of Administrative Studies and Politics, Faculty of Economics and Administration, University of Malaya, 50603 Kuala Lumpur, Malaysia

ABSTRACT

Occupational Safety and Health (DOSH) Malaysia reported that accident and fatality rate are anticipating to rise constantly over next few years. Physical, psychological and social hazards are the factors that cause occupational accidents and illness, subsequently jeopardised workers’ health and safety. There are extensive occupational health and safety studies conducted in various sectors, but it is less focused on the public sector, particularly public university. Therefore, this paper intends to examine the factors impact safety culture, which involve attitude and practice among public sector’s workers particularly in public university. The study employed quantitative approach specifically mail questionnaire were utilised as the main instrument to collect the information. The data were analysed using Statistical Package for Social Science version 25. In anticipation to investigate association between physical, psychological and social hazards with safety culture, Spearman’s Rank Correlation Coefficient was deployed. Besides that, to scrutinise relationship among variables, ordinal logistic regression analysis was performed. The study finds that only psychological hazards has significant correlation with attitude (ρ=.272). Further examination on the relationship between variables, the study discovers that only psychological factors have significant influence on practice (p=.002, OD=7.264). This study has exposed empirical relationship between physical hazards, psychological hazards and social hazards factors with safety culture. The university management must diligently address these factors as the exposure to these hazards can cause occupational diseases and work accidents.

Keywords: Physical hazards; psychological hazards; occupational health and safety; public university; safety culture

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1. Introduction

Occupational Health and Safety is the discipline of legislation to eradicate and abridge occupational risk and hazards. In the endeavour to reduce risk in the workplace, it is imperative to preserve and protect human resources by promoting safety and health in a conducive workplace’s environment [1]. Subsequently, management system of OHS with the efficacious execution and the compliance towards regulations has been emphasised by the International Labour Organisation (ILO), as one of the methods to enhance workplace’s safety culture [2]. Based on ILO report, the amount of people engaged in occupational accidents or illness at global level is more than 2 million per annum

* Corresponding author.
E-mail address: nurhairani@um.edu.my

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These incidents significantly affect the workers as it jeopardised their health and safety. In the case of Malaysia, Occupational Safety and Health Act 1994 is the legal framework to foster and inculcate safety culture among workforce [4]. The framework is an approach to guide workforce attitude on safety to eradicate occupational accidents and must be abide by both employers as well as employees. All sectors in Malaysia including public and private sector are ought to abide to Occupational Safety and Health Act (OSHA) 1994 in order to assure safety work place. However, further substantiation from DOSH Malaysia [5] declared that, in 2017, 6020 cases reported in 2017 and approximately 7829 cases reported in 2016 are pertaining to work-related poisoning and disease as represent in Table 1 [5,9]. Shockingly, in comparison to 2015, the number of cases increased in 31.2% tantamount to 5960 cases reported. Over next few years, the trend is anticipated to rise constantly. Occupational accidents and injuries occur when workforce based on their own interpretation of safe and unsafe attitude. The major contribution to the safety culture is the identification of attitude and behaviour of workforce as the positive safety culture able to promote safe practice of work. Abdullah et al., [6] depict safety culture as “the attitudes, beliefs, and perceptions shared by natural groups as defining norms and values, which determine how they react in relation to risks and risk control systems”. Mohammadi et al., [7] further explain that in order to ensure high standards of safety performance, strong safety culture is crucial among both employers and employees. Moreover, Kasim et al., [8] proposed three characteristics of a strong safety culture namely: 1. norms and rules for dealing with risk; 2. safety attitude; and 3. reflexivity on safety practice. The safety culture might be varying across the organization as it might have different priority in managing work hazards.

| Year | Number of cases |
|------|-----------------|
| 2005 | 319             |
| 2006 | 420             |
| 2007 | 594             |
| 2008 | 545             |
| 2009 | 791             |
| 2010 | 1426            |
| 2011 | 1198            |
| 2012 | 1792            |
| 2013 | 2588            |
| 2014 | 2648            |
| 2015 | 5960            |
| 2016 | 7820            |
| 2017 | 6020            |

The high rates of affiliated morbidity and mobility made the occupational health and safety as crucial matter to be addressed. As stated by Rugulies et al., [10], three elements that can cause occupational accidents and illness are the job need to be performed, tiredness due to unreasonable
work time and job demands and the employee himself/herself, which can be described as the physical, psychological and social factors. This is in agreement with the claims made by scholars [11,12] that human factors are the element engendered problem in administering health and safety at work because of their failure to execute correct procedure in performing their job. Physical hazards generally involve as noise, vibration, radiation, extremes of temperature, ergonomic [13]. Moreover, Tawiah et al., [14] argued that physical hazards can have a greater impact on the worker’s safety experience. Employees such as nurses often vulnerable to the physical hazard due to workload of taking care of the patients and experience mental fatigue. In addition, Clarke and Cooper [15] further exposed that working in a stressful environment can create the risk of physical illness and also psychological distress. Workplace Health and Safety of Queensland [16] describe psychological hazards as hazards that affect mental state wellbeing of individual. Psychological hazards impact workers’ ability to work in a healthy as well as in safe manner if it is not effectively managed and could be labelled as job stress. Job stress might be resulting from overburden of tasks, long working hours, sadness and lack of control are associate with increase of workplace injury and workers sickness [17]. On top of that, the employees also deal with psychological burden due to the stress working condition and thus, might affect their health [18]. Besides, Cox and Griffiths [19] described social hazards as the relation among organization, management, colleagues and family. The relation creates hazardous influence towards personnel’s attitude and experience on safety performance in the workplace [20]. Social hazards also refer to interpersonal relations. It comprises low levels of co-worker support, lack of managerial recognition, instances of bullying and harassment, and occupational violence [21]. This is due to the risk of occupational injury and lower life expectancy might be resulted from physically ill employee, long work schedule and heavy workload [18]. Therefore, these hazards factors must be diligently examined as the exposure to these three hazards can cause occupational diseases and work accidents.

In accordance to the public sector, as it covers the broad-spectrum occupations and workplace, each of the occupations has their own risks and threats, which also unexceptional to many public sector workplaces. The occupation might vary from the risk to hazards, the operation as well as execution of risky tasks and finally, the exposure to the injury [22]. Public sector workplaces precisely office environment may be reviewed as having low hazard and threat. Nevertheless, public servants must aware of the potential hazards and threat that might exist. As emphasised by Australian Commission [23], the environment which public servants work at, the equipment, how they perform their task, could be risky and dangerous for instance extended time of keyboard usage, poor design of workspace or manual handling. Apart from that, health hazards and threat may involve violence in the workplace, bullying and stress. Public sector agencies must take into consideration the wide spectrum of hazards that might exposed in their workplace. Therefore, in order to handling affiliated risks and threat in the workplace, it is crucial to recognize the factors that might impact the safety culture exist in the organization, particularly in public sectors. Ultimately, an effective implementation of an OHS able to ensure that the numbers of injury and accident will be reduced and safety culture at the workplace can be cultivated. In the light of the previous studies, it proves that there are numerous researches investigating on occupational health and safety in other sectors, however not in public sector. The significance of safety climate has extensively emphasised in industrial sector and health care, however the safety climate in public sector are not receive the same attention. Thus, the study looks on the public sector specifically in public university in the light to meet the research gaps in occupational safety and health. By virtue of that, to improve and strengthen the execution of OHS management system specifically in higher education institutions, this study intends to examine the factors impact safety culture, which involve attitude and practice among employees in public university. Without due diligence safety, physical, psychological and
social hazards are the risk factors that can affect workers’ attitude and practice, thus influence occupational injuries and hazards.

2. Methodology

The study employed quantitative approach to collect the data from respondents. A simple random sampling was adopted to select the target respondents. Sekaran and Bougie [24] argued that, this technique is competence enough to provide compelling information to the study because each part of the population has an equivalent opportunity to be chosen. In addition, this technique is very beneficial to answer research questions that require the generalisation of the population. The study involved 164 assistant engineers, who involve in high-risk job and expose to the occupational injuries. The high-risk job and critical services are entitled the employee to ensure the university can operate smoothly when facing the situation of disaster and emergency, thus subject the employees to various occupational hazards. Moreover, the study conducted in one public university only, which is the University of Malaya. The questionnaire survey was distributed online through email in April 2019, with 89 percent of response rate, equivalent to 146 feedback received and included in the analysis. In order to gain feedback and high response rate, the follow-up calls to the respondents were carried out. Besides that, a reminder notice was sent to the non-respondents through email, as a method to encourage participation from respondents. The data collected were coded, entered and analysed using Statistical Package for Social Science version 25. In anticipation to investigate the association between factors and safety culture, Spearman's Rank Correlation Coefficient. Detail analysis on the relationships between variables was also conducted to examine factors that influence the safety culture (in the form of attitude and practice) by performing Ordinal Logistic Regression analysis. Throughout this study, the conventional level \( p \leq 0.05 \) was set to denote statistical significance.

3. Results

Table 2 depicts the demographic characteristics of respondents. The study revealed that most of respondents (76%) were within the age of 30 to 39 and the least (4.1%) were 20 to 29 years old. About 11.6% of the respondents were 40 to 49 years old. Meanwhile, 8.2% of the respondents were 50 to 59 years old. Majority of respondents were diploma holders (68.9%), and 18.9% were Certificate holders. About 21.2% of the respondents were certificate holders, 71.9% were diploma holders and the rest, 6.8% were the degree graduates. For the length of employment, 45.9% have worked for 10 to 19 years, followed by 40.4% have worked less than 10 years.

| Table 2 |
| --- |
| Demographic Characteristic of Respondents |
| Variable | Category | Frequency (n=146) | Percentage (%) |
| Age | 20 – 29 years | 6 | 4.1 |
| | 30 – 39 years | 111 | 76.0 |
| | 40 – 49 years | 17 | 11.6 |
| | 50 – 59 years | 12 | 8.2 |
| Level of Education | Certificate | 31 | 21.2 |
| | Diploma | 105 | 71.9 |
| | Degree | 10 | 6.8 |
| Years of Working experience | Below 10 years | 59 | 40.4 |
| | 10 – 19 years | 67 | 45.9 |
Reliability test was conducted for all variables. The reliability results were presented in Table 3. The Cronbach’s Alpha value for all variables ranging from .749 to .831, which indicates that all variables are reliable instrument and can be included in the analysis.

| Variable       | No. of item | Cronbach alpha (α) |
|----------------|-------------|--------------------|
| Physical factors| 10          | .822               |
| Psychological factors | 9             | .831               |
| Social factors   | 8           | .751               |
| Attitude        | 12          | .767               |
| Practice        | 5           | .749               |

Spearman’s Rank Correlation Coefficient was performed to evaluate the strength correlation among variables. Table 4 presents the inter-correlations among physical factors, physiological factors and social factors on safety culture. The analysis reveals that only Psychological factors has significant correlation with practice ($\rho=.272$). However, this association presents weak relationship between the variables. Meanwhile, all factors (physical, psychological and social factors) present negative relationship with attitude.

| Variable       | Attitude | Practice |
|----------------|----------|----------|
| Physical factors| -.091  | .039     |
| Psychological factors | -.077  | .272*    |
| Social factors   | -.093  | .053     |

*Correlation is significant at the 0.05 level (2-tailed)

Table 5 summarises findings of the ordinal logistic regression in examining factors influencing attitude and practice. The results show that physical factors ($p=.816, \text{OD}=.891$), psychological factors ($p=.676, \text{OD}=.767$) and social factors ($p=.248, \text{OD}=.389$) present no significant influence towards attitude. Meanwhile, only psychological factors identified to have significant influence towards practice. This result indicates the positive effect $\delta=1.983$, which is statistically significant based on Wald Test with $p=.002$. The cumulative odds ratio is $\exp(1.983)=7.264$, which means, there is an increase of 7.264 times the influence of psychological factors on practice. The other two variables, physical factors ($p=.450, \text{OD}=.691$) and social factors ($p=.960, \text{OD}=.961$) reported $p>.05$, which denote no significant influence on practice.

4. Discussion

This section describes the result of Spearman's Rank Correlation Coefficient and ordinal logistic regression between physical, psychological and social factors on safety climate, which are attitude and practices on occupational health and safety.
4.1 Assessment of Personnel’s Physical Factors on Attitude and Practice

The finding presents physical factors has no significant influence on attitude and practice. Previous studies explained that there is possibility of who were formerly injured became more cautious and more compliant in observing the safety requirements. In addition, the personnel who previously involved in any accidents and injuries might influence their attitude on safety performance. Similar argument is also found in Sawacha, Naoum and Fing [25], which focused their study on construction workers. Besides that, this aspect is also included in and Hinze, Thurman and Wehle’s [26] study in measuring measure the safety performance. Past studies have concluded that the more significant the accidents or injuries to them, their perception as well as attitude towards safety precautions are positive as they attempt to minimize the hazards and risk that might be exposed. Moreover, among other factors, physical hazards are occurred to be the most hazards experience by the workers. The pains were felt in some part of the body due to the nature of assistant engineers’ work, which expose to the various hazards such as electrical hazards, slips and fractures. In reducing the accidents or injuries, it is suggested by previous study that the incentive (financial and non-financial rewards) can be provided to the workers to motivate them working in a safer manner [27,28]. It is believed that, by providing incentives to the workers, it would improve safety performance in the workplace [29,30].

4.2 Assessment of Personnel’s Psychological Factors on Attitude and Practice

Meanwhile for the psychological factors, the study exposed the relationship was significant between practice only, which similar findings presented in Ford and Tetrick [22]. The study proves strong association between psychological safety and safety culture. The above explanation of the results of correlation provides interesting and encouraging evidence because it is empirically certain that any individual who experienced psychological injuries has developed certain attitude and perception on safety performance. The study also revealed that the level of psychological fatigue among the workers are moderate level, which indicates that, the workers who involve in workload, might become stress and subsequently influence their attitude towards safety performance. This claim is also supported by several past studies that found psychological factors has significant effect on safety compliance [32-35]. In the context of practice, psychological factors do not influence the personnel’s execution of works pertaining to safety. In such manner, the psychological injuries might develop certain attitude towards safety. However, the personnel might employ good safety performance in order to minimize the injuries and accidents.

4.3 Assessment of Personnel’s Social Factors on Attitude and Practice

In the context of social factors, correlation and regression analysis denote that social factors has no significant influence on attitude and practice. The results of correlation provide interesting evidence because previous study has empirically assured that any individual experience social injuries, their practice of work might be affected. In other words, individual who has relation difficulties among family and friends, will not execute safety practice in the workplace. In contrast, those who has positive social relationship with family and friends, able to perform safety practice in executing the jobs. However, personnel’s social factors did not influence their attitude on safety performance. Although the individual might have social problems as the social factors are the least experience by the workers, their attitude on safety remain the same. This is in contrast with Lenne et al., [36] argument, whereby the study found that social aspect can predict the involvement of the
workers on safety measures, which Casey and Krauss [37] believe it is significant to enhance safety performance.

5. Conclusions

The identification of OHS contributing factors particularly in physical, psychological and social are crucial in developing and implementing effective safety culture in order to address and prevent occupational accidents and hazards. In order to minimize injuries in the workplace, good safety culture with a good management practice is crucial. This is in line with Gershon et al., [17] that, fewer occupational injuries and accidents involving the workers happened in the organisation that have positive safety climate. This is because, a safe working environment encourage and boost safety attitude among workers, which in turn affects their practices. Based on the findings of this study, it indicates that safety climate is vital in public sector and associated with workers’ attitude as well as practices. However, physical, psychological and social factors affect differently on safety culture, which has been categorised as attitude and practice. The only factor that influence the safety culture is psychological factor. The possible explanation is might be due to personnel’s experience on psychological hazards experience, especially when examining the nature of their working condition, influence their practice towards safety. This is because, the experience might influence them to develop positive attitude and portray good practice in order to avoid the accidents and injuries. For the effective implementation of OHS in this university, the management implement and practice the suggestion projected in this study. First and foremost, Occupational Safety and Health department or unit should strengthen the execution of safety regulation by emphasise more on the regulation and regularly make inspection whether the regulations are followed by the workers or not. Apart from that, training, safety briefing, awareness campaign should be held to increase awareness among workers and encourage them to participate in safety work practices. Workers can be enlightened to the possibility of accidents, ways to avoid the hazards by implementing excellent safety training. In addition, majority of employees have to gain knowledge of risks of their work through their experience of work itself as the experience influence their attitude and practice of safety performance. Ultimately, it is exceptionally vital to allocate adequate proportion of budget in order to provide safety equipment to the workers. Majority of the respondents expressed that the personal protective equipment is scarcely provided by the management. Thus, with regard to reduce the occupational injuries and hazards in public sector, an effective implementation of OHS must be executed and strengthen.

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### Table 5
Factors influencing attitude and practice

| Variable         | Attitude | | | | | Practice | | | | |
|------------------|----------|---|---|---|---|---|---|---|---|---|---|
|                  | Estimate | Standard Error | Wald, $X^2$ | Odd ratio | 95% of Confidence Interval | $P$-value | | Estimate | Standard Error | Wald, $X^2$ | Odd ratio | 95% of Confidence Interval | $P$-value |
| Physical Factors | - .115   | .495        | .054        | .891      | -1.085 | .855 | .816 | - .369   | .488        | .571 | .691 | -1.327 | .588 | .450 |
| Psychological Factors | - .266   | .636        | .174        | .767      | -1.513 | .982 | .676 | 1.983    | .635        | 9.753 | 7.264 | .738 | 3.227 | .002 |
| Social Factors   | - .943   | .816        | 1.335       | .389      | -2.543 | .657 | .248 | - .039   | .790        | .002 | .961 | -1.589 | 1.510 | .960 |