

Safety Awareness among Office Workers and its Relations to Safety Attitude, Safety Culture and Safety Climate in Oil and Gas Industries

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ABSTRACT

Previous research found out that 46.0 percent office workers worked in a very bad condition or unsafe workplace. During the preliminary interview with one of the companies in the oil and gas industry, the manager admitted that the level of safety awareness of the office workers was low as most actions were focused on the plantation site and rarely on the office workers even though there were also some minor accidents that had occurred in the office. Another study also mentioned that the level of safety awareness of oil and gas industry in Malaysia is low, therefore, this research aimed to study about safety awareness in the oil and gas industry. Three factors had been identified as being relevant to safety awareness namely safety culture, safety attitude and safety climate. This research also aimed to examine the relationship between safety awareness, safety culture, safety climate and safety attitude. Two hundred and twelve (212) questionnaires were distributed to oil and gas office workers, and 157 were completed and analyzed. Two out of three variables were significant: safety climate and safety attitude, and one variable, safety culture, was not significant. For future research, this study suggested a bigger sample size and qualitative data for an in-depth study.

Keywords: *safety attitude, safety awareness, safety climate, safety culture, oil and gas industry*

INTRODUCTION

The oil and gas industry is a challenging system in which they must interact with many different factors, including technical, social, organizational, human, managerial and environmental factors. Failure to do so can lead to a disastrous event (Cullen, 2011). A substantial literature has pointed out that the major areas where hazards might develop in the workplace can be divided into the physical workplace, the people and the management (Makin & Winder, 2010; Dollard & Knott, 2004). In a physical workplace view, mechanical, structural and process design failures are possible occurrences (Ifelebuegu et al., 2019). Ajmal et al (2022) mentioned that even though in 21st century, technological advancement increased organization productivity, ensuring workplace safety and raising awareness to the workers is still the biggest challenge for the researchers and practitioners to reduce occupational health and safety expenses. For the record, Malaysian government and private institutions including Social Security Organization (SOCSO) had raised awareness about workplace safety practices especially in the oil and gas industry. Studied done by Niciejewska and Kač (2019) discovered that almost 50 percent of office workers (about 46.0 percent) work in a very bad conditions or unsafe workplace. The same authors also mentioned the lack of awareness about the effect of the work environment on the health and human body which could result in more frequent accidents or health problems of employees. It is necessary to manage individual elements of the work environment to achieve optimal working condition and motivated employees. Factors that occurred in the work environment such as moving parts of office equipment, temperature, humidity, electric current and movement of air molecules, physical and psychological constraints were among factors that can affect the employees and their safety.

In Malaysia, news reported by Borneo Post Online in 2016 showed the increasing numbers of accidents related to ergonomic cases which explained that for every four reported cases, one case will be related to ergonomic case that often found in office setting workplace. As reported by Department of Statistics, Malaysia, in 2021, they were about 21, 534 occupational injuries and 4.0 percent out of the occupational injuries that were reported, were cases of office workers. Since the oil and gas industries were among the highest rate of accidents and workplace injuries, the researchers are curious whether the safety awareness is being focused among the workers in the sector including of those working in office setting environment. One of our researchers did the preliminary interview with the manager of one company in oil and gas industry in Malaysia and found out that the safety awareness among the office workers in his company was low as most precautions were taken at the plantation site even though they were some accidents occurred in office environment setting.

From people's views, negligence and carelessness have always been the natural causes of accidents. In contrast, in the management's view, the management's inability to make decisions concerning ensuring the protection of the health and safety of the workers and their environment seems to be the major issue (Nolan, 2011). The nature and business in the oil and gas industry and the chemical and complex processes involved have stated the industry as high risk. Attwood, Khan and Veitch (2006) proposed that accidents occur for three reasons: human error, hardware failure and external events. Due to advances in technology, equipment malfunctioning or hardware failure has reduced in recent years and thus highlights the human factor error as accidents continue to occur even when there are tremendous improvements in the equipment.

Ifelebuegu et al. (2019) discovered that even though many health and safety regulations have been implemented heavily, major accidents still exist, especially in the oil and gas industry. Therefore, according to the authors, it is essential to understand the role of human error in accidents so that major safety can be upheld, and accidents can be avoided. Several studies have been conducted in this area, and several models have been developed to understand the cause of accidents and to measure and manage human error. Dejoy (2005) and Thory (2016) discovered that human behaviour is influenced by various factors, including emotions, awareness, culture, climate, attitude, authority, ethics, personality, training and experience. Any ignorance in one of those factors may result in a human

hazard. However, most of the previous authors gave greater emphasis on accidents that occur at the site and rarely focused on the office setting or office environment setting. Malaysia is a special case as its emphasis is on occupational health and safety law guidelines. Therefore, government and private institutions raise awareness about workplace safety practices as accidents continued to occur even though some precautions had been taken (Ajmal et al., 2022). Karanikas et al. (2018) had discovered that there had been limited research regarding safety awareness and the influence of human factors. This discovery also made the researchers question the level of safety awareness of the office workers, as Karanikas et al. (2018) also mentioned that poor ergonomics and a combination of tedious tasks with long working periods usually happen in an office setting environment that led to injuries and accidents. In Malaysian context however, as mentioned above, precautions were taken at the plantation site and rarely focused on the office setting environment in the oil and gas industry. Furthermore, research conducted by Naji et al (2020) found out the low level of safety awareness among workers in oil and gas industry in Malaysia. With 4.0 percent of accidents in the workplace happened in the office environment setting because of low level of safety awareness, therefore, this research was conducted for two purposes: first, to examine the factors that could influence safety awareness and second, to analyse the relationship between safety awareness with safety culture, safety climate and safety attitude in the office setting of oil and gas industry.

LITERATURE REVIEW

Safety Awareness

Based on Occupational Safety and Health council, safety awareness is how people perceive and have knowledge of the situation and how they react to solve unwanted events or think ahead to avoid unwanted events. In their study, Walker et al. (2012) stated that most accidents happened because of a lack of safety awareness. Walker et al. (2012) also highlighted that poor safety awareness happened due to limited knowledge and personal behaviour. Salmon and Stanlon (2013) argued that safety awareness is a multi-dimension concept dependent on training and personal behaviour. Training is part of a safety climate, according to Baron (2008), and behaviour is part of the attitude, according to Karanikas et al. (2018). Ibrahim et al. (2012) and Dodge (2011) found that safety awareness is related to safety culture.

Safety Culture

According to Al-Mekhlafi et al. (2021), safety culture in many countries is competitive, especially in the oil and gas industry, because it is a global requirement for sustainable growth. According to Al-Mekhlafi et al. (2021), safety culture refers to how individuals and organisations take personal responsibilities for safety acts, recognise and communicate safety concerns and adapt to the behaviour based on lessons learned from past mistakes and thus becoming the organisational culture. Choudhry et al. (2007) defined safety culture as the outcome of individuals' and groups' attitudes, values, competencies, and habits representing the organisation's commitment to handling safety issues. Ibrahim et al. (2012) found a positive relationship between safety awareness and safety culture.

Safety Climate

According to Noor et al. (2022), safety climate refers to how individuals view workplace safety rules, procedures and practices. According to Noor et al. (2022), currently, there is no consensus regarding the safety climate dimension. Noor et al. (2022), Baron (2008) and Cheyne et al. (2002) also mentioned that safety climate referred to the effect of environment and organizational factors on organizational values. Xu et al. (2020) pointed out that safety climate can be grouped into management commitment, organizational habits, safety engagement and communication, safety equipment, housekeeping, training and rewards. Cheyne et al. (2002) and Baron (2008) also discussed the relationship between safety climate and awareness related to those variables.

Safety Attitude

Safety attitudes are tendencies to evaluate an entity with some degree of favour or disfavour, ordinarily expressed in cognitive, affective and behavioural responses (Eagly & Chaiken, 1993). Attitudes could affect three components, including cognition (beliefs), feelings and habits. Jones (2009) researched safety attitudes regarding people and risk and discovered five determinants: individual community, workplace safety condition, safety arrangement effectiveness, personal responsibilities and individual scepticism. Baron (2008) and Cheyne et al. (2002) also found that the relationship between safety awareness and safety attitude was positively significant.

Based on the literature review above, this study proposed the following hypothesis:

H₁: there is a significant relationship between safety climate and safety awareness

H₂: there is a significant relationship between safety culture and safety awareness

H₃: there is a significant relationship between safety attitude and safety awareness

RESEARCH METHODOLOGY

This part discusses the method used in this research. The methodology involves techniques used, questionnaire design and data collection procedure.

Data Collection Method

In the current study, the unit of analysis was individual and cross-sectional data were collected from the employees of administrative departments of the oil and gas companies in Malaysia. Those respondents were workers at managerial level or clerical staffs. The reason sample selections were selected from office administrative setting because they were also involved with workplace accidents due to unsafe workplace such as the working environment is not ergonomic enough and these participants were selected from various places in Selangor. The literature shows that the oil and gas industry is safety sensitive, but data collection was a challenge therefore a convenience sampling technique was employed. In addition, the purpose of data collection and implications of results were discussed with safety managers and confidentiality of provided information was assured.

Data for safety awareness, safety culture, safety climate and safety attitude were collected using Likert scale with five options, 1 for strongly disagree and 5 for strongly agree with sample item included and have been adopted from previous studies which are from Manitoba (2022), Baron (2008), Cheyne et al. (2002) and Barling et al (2002). The questionnaires are used to analyse the relationship between this study's dependent and independent variables. The survey questionnaire used close-ended questions to facilitate the measurement and data analysis. The questionnaires were administered to a randomly selected number of oil and gas office workers in various departments. Care was taken to ensure that information was gathered from all levels of management to enhance the results. Data on the participant professions were collected through this survey questionnaire. The questionnaire gathered information about safety awareness, safety climate, safety culture and safety attitudes. One hundred fifty-nine (159) responses were collected from 212 distributed questionnaires. Out of 159 responses, only 157 responses were completed and being used for analysis purposes. Response rate were 74.06 percent and according to Sekaran and Bougie (2016), 157 responses can be accepted to analyze the data and were enough to justify the results.

Data Analysis

The statistical package for social science (SPSS) version 18 was used in evaluating the relationship between safety awareness and safety climate, safety culture and safety attitude. A regression analysis was conducted to determine the correlation coefficient of variables and ascertain the strength of the relationship between all variables.

FINDINGS AND DISCUSSION

All the questionnaires were distributed to respondents and were measured using Cronbach's alpha to test the reliability of all the variables that represent both the dependent and independent variables. Based on the result analysed, all the items are reliable since all the variables have good internal consistency as they fall under the range of 0.8 to 0.95. According to Sekaran and Bougie (2016), they can be accepted as a reliable variable. Based on the descriptive analysis of the demographic profiles of the respondents, it is found that most of the respondents are female, representing 62.4 per cent of the sample. At the same time, the remaining 37.6 per cent are male. The following professions featured among the 157 responses: Senior General Manager (1.3 per cent), General Manager (5.7 per cent), Senior Manager (5.7 per cent), Manager (20.4 per cent), Executives (47.1 per cent) and non-executives (19.7 per cent). In the sample, they worked in various departments such as finance (24.8 per cent), human resources (11.5 per cent), information technology (9.6 per cent), audit (5.7 per cent), strategic planning and venture (33.1 per cent), corporate affairs and administration (6.4 per cent), health, safety and environment (3.8 per cent) and risk management (5.1 per cent).

Table 1: Pearson's Correlation Analysis

	Safety Awareness	Safety Culture	Safety Climate	Safety Attitude
Safety awareness	1	0.338	0.778	0.558
Safety culture	0.338	1	0.454	0.611
Safety climate	0.778	0.454	1	0.819
Safety attitude	0.558	0.611	0.819	1

*N = 157, ** Correlation is significant at the level 0.05 level (2-tailed)*

The research aims to determine the relationship between the dependent variable, safety awareness, and the independent variables of safety climate, culture and attitude. Table 1 illustrates the relationship between the variables. The Pearson's Correlation coefficient result shows that all variables are correlated. The strongest correlation is between safety awareness and safety climate, around 0.778, followed by safety attitude (0.558) and safety culture (0.338). The weakest correlation is safety culture, as shown in Table 1.

Table 2: Summary of Regression Analysis between Variables

Summary		Anova			
R	R Square	F	Sig		
.792 ^a	.627	85.813	.000 ^b		
Dimensions	Standardized Coefficients		Collinearity Statistics		
	B	t	Sig.	Tolerance	VIF
Safety Climate	.985	11.387	.000	.326	3.068
Safety Culture	.069	-1.106	.271	.620	1.614
Safety Attitude	-.291	-2.985	.003	.257	3.891

R-Square is the proportion of variance in the dependent variable (safety awareness), which can be predicted from the independent variables (safety climate, culture and attitude). This value indicates that 62.7 per cent of the variation in safety awareness among office workers in the oil and gas industry can be explained by the independent variables: safety climate, safety culture and safety attitude. Meanwhile, the remaining 37.3 per cent of the model is explained by other factors. The R-value is 79.2 per cent, which indicates that both the independent and dependent variables share the deal of variance. As displayed in Table 2, the F-value is 85.813 and its marginal significance is (Significance value = 0.000). The result of the three independent variables shows that safety climate (β 0.985, $p < 0.01$), safety culture (β 0.069, $p > 0.05$) and safety attitude (β -.0291, $p < 0.01$).

Table 3: Summary of Hypothesis Results

	HYPOTHESES	RESULTS
H ₁	There is a significant relationship between safety awareness and safety climate	H ₁ Supported P = 0.000
H ₂	There is a significant relationship between safety awareness and safety culture	H ₂ Rejected P = 0.271
H ₃	There is a significant relationship between safety awareness and safety attitude	H ₃ Supported P = 0.003

This research aims to analyse the relationship between the independent variables: safety climate, safety culture, and attitude and the dependent variable, safety awareness. The results generated by this paper explain that safety awareness and safety climate, and safety awareness and safety attitude have a significant relationship (Table 3). These results are supported by Cheyne et al. (2002) and Baron's (2008) studies. However, there is no significant relationship between safety awareness and safety culture, as this research had rejected the hypothesis. The result was conflicted with Ibrahim et al. (2012) and Dodge's (2011) study, which found that safety culture is positively related to safety awareness. However, this research result was similar to Ostrom et al. (1993), who conducted a thorough study on safety culture and part of safety awareness.

CONCLUSION

The paper aims to examine the relationship between the independent variables, safety climate, culture and attitude, and the dependent variable, which is safety awareness. An analysis of the opinions of oil and gas industry office professionals regarding safety awareness and the factors contributed to it: safety climate, safety culture and safety attitude. The study further identified factors that contribute the most to the relationship. In this research, even though all three independent variables are related to safety awareness, they have different degrees of relationship. The strongest relationship is between safety awareness and safety climate. The moderate relationship is between safety awareness and attitude, and the weakest link is between safety awareness and culture. Hence, most of the research respondents emphasise safety climate and ignore safety culture. For future studies, researchers should include other possible factors related to safety awareness. Their studies can focus on qualitative research methods to ensure results from different points of view. In addition, the sample size should be larger than 200 samples and they may also extend their surveys to other industries.

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AUTHORS' CONTRIBUTION

Wan A. F. W. A. A. and Ali, N. M. conceived and planned the research with data preparation. Borhanuddin, R. I., Kamaruddin, K., Noor, H. M., Salleh, S. M. and Mokhlas, H. contributed by writing for literature and contents in this research, while Wan A. F. W. A. A. analyzed and interpreted the results. Ali, N. M. took the lead in finalizing the final report of the manuscript. All authors provided critical feedback and helped shape the research, analysis and manuscript.

CONFLICT OF INTEREST DECLARATION

We certify that the article is the original work of the authors and co-authors. The article has not received prior publication and is not under consideration for publication elsewhere. This research/manuscript has not been submitted for publication, nor has it been published in whole or in part elsewhere. We testify that all authors have contributed significantly to the work, validity and legitimacy of the data and its interpretation for submission to Jurnal Intelek.

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