

Examining the Relationship between Safety Climate and Safety Behavior: A Case Study of Malaysia Power Supply Company

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Abstract

Previous researchers have paid significant attention to the effect of the safety climate on individual safety behaviors. However, the findings are still indecisive and inconclusive. Drawing upon the Theory of Planned Behavior, this study specifically investigated the relationship between safety climate (management commitment, supervisor's and workmate's role, risk taking behavior and worker's involvement) and their safety behavior. This study adapted the instruments constructed by previous researchers to measure all variables. Prior to actual study, a pilot study was conducted in order to assess the reliability and appropriateness of the measurement used. This research used the probability sampling technique that is simple random sampling. Out of 155 questionnaires that have been distributed to the maintenance and engineering workers in Company Y of Malaysia's power supply industry, only 100 have been completed and valid for this study. The data gathered was analyzed by using SPSS Version 23. The results were basically in the form of reliability, frequency and multiple regressions. The research findings showed a positive association between management commitment, supervisor's and workmate's role, worker's involvement as well as risk taking behavior on the individual's safety behavior. The findings also showed that management commitment tends to be the significant predictor towards the individual's safety behavior. Theoretical discussion, practical managerial implications and direction for future research were also being discussed.

Keywords: Safety Climate, Management Commitment, Risk Taking Behavior, Supervisor's Role, Workmate's Role, Worker's Involvement, Safety Behavior, Theory Of Planned Behavior

Introduction

Better workplace health and safety practices lift productivity and improve the quality of employees' working lives. It has already been a responsibility for every company or organization to seek safety concerns in the workplace to provide the employees with security and good condition while working. Safety workplace environment could protect the employees and businesses from the risks and danger that could affect the business operations. Besides be as an essential part to move towards sustainable development, good management on the health and safety issues reflects the strong leadership of the business (Institutions of Occupational Safety and Health, 2024). However, the major concern here is how the safety climate could affect the individual behavior. This is because, despite the management effort on ensuring their employees' well being, there are still workplace accidents and deaths reported worldwide (Tan et.al., 2023). The International Labor Organization (2020) reported that globally, occupational related accidents rank as the third leading cause of death with approximately 160 million work-related illnesses and 340 million occupational accidents reported occurring annually. Furthermore, each year, about 2.3 million employees worldwide lose their lives due to work-related diseases and accidents (Tan et.al., 2023). According to Chief Statistician of Malaysia Statistics Department, Dr Mohd Uzir Mahidin, although many countries including Malaysia have implemented safety regulations and initiatives to reduce workplace accidents, the reported number of occupational injuries increased by 58.9% for year 2022 from the previous year in which all states except Perlis recorded notable increase in the workplace injuries (The Star, 2023). Thus, to overcome these noteworthy number of injuries, illnesses and accidents at the workplace, the factors that contribute to occupational injuries and accidents should be investigated.

Previous researchers believe that social climate predicts individual safety behaviors (Kalteh et. al., 2021; Aliabadi et al., 2020; and Alruqi et.al., 2018). According to Alruqi et.al. (2018), many studies have reported the positive relationship between social climate and employee safety behavior. In addition, previous studies also found that a safety climate is an appropriate tool in promoting the safety motivation in an employee (Mohammadfam et.al., 2022). Unfortunately, there are still some ambiguities on how social climates could predict the safety behavior of the employees (Braunger et.al., 2013). Therefore, this study aims to examine the effect of safety climate as the independent variable in the prediction of employees' safety behavior at the workplace, particularly among the maintenance and engineering department employees in Company Y of Malaysia's power supply industry.

The significance of this study in terms of knowledge can be tapped from the understanding of safety climate – safety behavior relationships through the lens of Theory of Planned Behavior, Maslow's Hierarchy of Needs and Social Climate Theory. Although safety climate is theoretically proven as one of the important concepts to employee safety behaviors, empirical investigation will provide concrete reference for management and academicians. Previous studies remain indecisive on how safety climate influences the safety behaviors of the employees as findings reported are few and inconsistent in terms of conceptualization and findings. This warrants more study to help in understanding what dimensions of safety

climate could influence the safety behavior of the employees thus signaling potential solutions for the management to solve and reduce the numbers of occupational injuries at the workplace therefore reducing the number of injuries at the national level as a whole.

Literature Review

The relationship between individual safety behavior and safety climate has been extensively studied by the previous researchers as they found some elements that resulted in positive feedback (Ahmed and Abid, 2013; Salazar-Escoboza et al., 2020; Marin et al., 2019; and Gutierrez et.al, 2013). However, there are also researchers that found weak interaction of safety climate and safety behavior. Therefore, more studies must be held to find out these inconsistencies and help to understand how the safety climate could affect safety behavior in different settings (Fang et.al, 2006). Other than that, according to Ahmed and Abid (2013), the safety climate has a strong direct effect with individual safety behavior when it comes to policies, roles, objectives, accountabilities, responsibilities, and etc.

Safety Behavior

Geller (2001), defined behavior as an individual's action that can be observed by others (Geller, 2001). Meanwhile, according to Chen et al (2021), and Neal et al (2000), safety behavior refers to behavior that is carried out by an individual in order to avoid danger. In which accidents could occur if the safe behaviors are neglected by the employees (Seo et.al, 2015). Griffin and Neal (2000) highlighted two main components of safety behavior which are safety compliance and safety participation. Safety compliance basically refers to the must be performed behavior by the workers in ensuring safety in the work environment. For example, wearing personal protective equipment while working (He et.al, 2023). Meanwhile, safety participation refers to the behavior that indirectly can enhance the workplace safety and contribute in developing a safe work environment; for example, joining safety related discussions and meetings organized by the management (Griffin and Neal, 2000).

Safety Climate

There has been long ago where researchers had found out that safety climate or safety management program affects the individual's safety behavior towards achieving safety performance targets. Unfortunately, there are more other reasons for the consequences of emerging individual safety behavior in the context of occupational safety and health systems (Neal et al., 2000). The safety climate or safety management program could be measured by organizational practices, communication and employee involvement in workplace safety and health especially for construction site workers (Neal et.al., 2000). Several dimensions of safety climate could be explained more in terms of management commitment, supervisor's role and workmate's role, risk taking behavior and also worker's involvement in safety management programs (Zhou et.al, 2011). Although there was extensive research on the safety climate, there are still inconsistencies in identifying the dimensions of the safety climate (Wu et.al, 2015). Review studies by Flin et al (2000), identified several common features of safety climate; however, these results were summarized from the qualitative studies. The interrelationships among different common dimensions need to be studied empirically thus warrants for more empirical studies to identify the reliability and validity of the safety climate dimensions (Wu et.al, 2015). This study measured the safety climates dimensions of

management commitment, supervisor's and workmate's role, risk taking behavior as well as worker's involvement as the potential predictors to employees' safety behavior.

Management Commitment. The company's attention towards safety could be explained more in terms of management, safety procedures and staff competence (Flin et al, 2000). In this context, management must ensure that they give their best service to their employees in order to achieve the targeted safety performance thus promising the company's productivity at the same time. Setting safety objectives through safety policy implementation across the organization (Reason, 2016) and preventive planning (Garcia, 2021) can help the organizations in preventing the dangers from happening.

Supervisor's and workmate's role. While in other perspectives, a good and systematic safety management system could be achieved if both employers and employees engage actively and willingly in the occupational safety and health programs and activities (Murugeson and Chelliah, 2012). The relationship between employers and employees can be measured by the dimensions of individual's commitment, manager's commitment and also policy commitment towards safety culture and climate as well (Amirah et.al, 2013). The safety climate in organizations may be diffused well to the workers if they build strong and good relationships between management and subordinates. Each of them may be influenced easily if they could cooperate together and willingly give much attention towards safety by making a win-win situation. By practicing it regularly, the leaders themselves could excel in creating open communication and grab great commitments from the workers. In fact, the workers would feel more secure and restrained themselves from doing jobs carelessly in an open and encouraged safety climate.

Risk Taking Behavior

Risk appears in several conceptual guises such as self-reported risk taking, perceptions of risk or hazards on the worksite and attitudes towards risk and safety which could influence more towards the successful implementation of safety management programs. Risk at the workplace may be indicated as an individual's behavior in taking risk, including the number of accident reporting and insufficient rules and personal protective equipment for workers (Mohammadfam et.al., 2022; Flin et.al., 2000). Generally, this kind of indicator could be measured well as risk is one of the most obvious factors that could be detected easily in measuring safety in the workplace. Risk also has been clarified to have a direct effect towards individual safety behavior. This is because individual safety behavior may have been exposed well in the context of risk-taking behavior of an employee (Flin et al., 2000).

Workers' Involvement

Previous researchers have found that worker's involvement gives some enhancement in building their commitment towards safety in the workplace. According to Brunette (2004), the worker's participation in the safety management system could bring some improvement in their safety practical training which helps them to get used with health and safety training materials as well. This will also improve employees' productivity by involving them in the activities of designing and developing decision making related to safety at the workplace.

Theoretical Explanation

Theory of Planned Behavior (TPB) by Ajzen (1991), best explained the interrelationship between safety climates and individual safety behavior. The main components that build up TPB are individual's attitudes, subjective norms, intentions, perceived behavioral control and behavior (Ajzen, 1991). Basically, TPB explains on how individuals' behaviors direct their behavior intention and perceived behavioral control. In which, an individual's attitude towards a behavior is determined by his or her core beliefs about the behavior consequence multiplied by the evaluation of the outcome desirability for each belief. This is because, intentions are shaped by individuals' subjective norms, attitudes and perceived behavioral control and these determinants are each rooted on underlying belief's structure. By implying TPB in explaining safety climate - safety behavior relationship, it can be conceptualized that when employees do not believe that the management is putting a lot of effort for safety (management commitment), their supervisors or colleagues are concerned with safety (supervisors' and workmate's role), their risk-taking behavior is harmful as well as involvement of employees in safety decisions are vital (worker involvement) they are less likely to consider safety as important. Thus, this will lead to an individual's behavior of acting in an unfavorable manner and prompt the employees to feel that they are incapable of completing their task according to outlying rules and procedures (Fogarty and Shaw, 2010).

Besides that, the safety climate can also be explained by Maslow's Hierarchy of Need Theory by Maslow (1943), in which human needs were arranged according to hierarchy starting with psychological needs at the first level, followed by safety needs, social needs, self-esteem needs and self-actualization needs. Maslow (1943), argued that survival needs need to be satisfied first before the other higher needs. After management has provided their employees with food, water, shelter and so on, they have to fulfill the next level of needs that is security and safety needs. These needs refer to the needs of freedom from fear, financial security, stable health, etc (Willingham, 2023). By fulfilling this level of needs, employees will be more secured in terms of their safety and security. Thus, implying hierarchy of need theory in the safety climate - safety behavior relationship, a completely safe working climate should be developed and implemented so that there will contribute to a favorable behavior of the employees. The safety climate should consider setting safety objectives and implementing safety policy (management commitment), good communications between employees and their supervisors as well as colleagues in diffusing safety climate (supervisor's and workmate's role), paying attention to the employees' risk-taking behavior as well as involving employees in safety related decision making.

Besides that, Social Climate Theory by Moos (2003), also can provide explanation on the interrelationship between safety climate and employees safety behaviors. Social Climate Theory has been introduced to give better understanding about the natural interplay between people and their respective social contexts in which, this theory helps in explaining how individuals adapt with their social environment and vice versa. Basically, Moos (2003), taps three prime dimensions of how individuals perceive that are firstly, how a setting organizes individuals' perception on social relationships; secondly, how individuals are being supported in their personal development; and thirdly how the settings handle the norms and support change processes. From the perspective of psychological measurement, social climate is very related to individuals' well-being indicators. Thus, by linking safety climate with employees'

safety behavior, it can be conceptualized that when the organization provides and promotes a safe working environment, the individual employees would reflect positive safety behaviors in their organization. Hence, this could avoid any occupational accidents from happening.

On the basis of the discussion related to the theoretical above, we proposed the following hypothesis.

H1: There is a relationship between management commitment and individual safety behavior.

H2: There is a relationship between supervisor's and workmate's roles and individual safety behavior.

H3: There is a relationship between risk taking behavior and individual safety behavior.

H4: There is a relationship between worker's involvement and individual safety behavior.

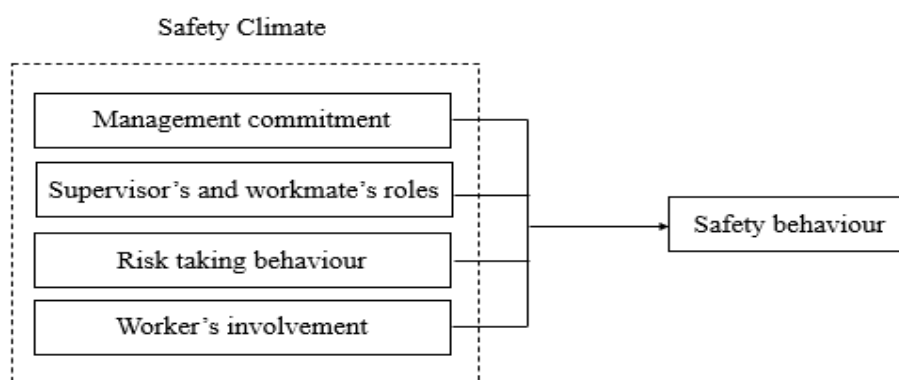


Figure 1: Proposed Framework

Methodology

Research Design

This research basically used the descriptive study in which investigation on a group of employees' characteristics have been made. This study specifically investigated employees in the maintenance and engineering department from Company Y of Malaysia's power supply industry. The basis of selecting this group of employees was because of the nature of daily jobs that are risky and expose to workplace accidents and injuries. In order to collect reliable data, informal interviews with few maintenance and engineering department staff about the nature of jobs have been made prior to questionnaire distributions.

Sampling Design

The sampling frame was 266 maintenance and engineering department staff from Company Y of Malaysia's power supply industry and the list was obtained from the Human Resource Department (HR). This research employed the probability sampling that is simple random sampling. The employees have been chosen from the name list given by the HR. The questionnaires were then personally distributed to the 155 employees that were randomly chosen from the list. The sample size of 155 has been decided based on the Krejcie and Morgan table (Sekaran and Bougie, 2011).

Data Collection and Analysis

The data has been collected within two weeks. Out of 155 questionnaires that have been distributed, only 100 have been returned and completed. As a total, the response rate for this study is 64.5%. Prior to actual study, a pilot study has been carried out in order to ensure the appropriateness of the questionnaire design. Overall, the selected respondents agreed that the items were easy to understand and clearly constructed.

Measures and Analytical Procedures

The questionnaire for this study has been divided into six sections; A,B,C,D, E and F consisting of the measurement of demographic profile, management commitment, supervisor's and workmate's role, risk taking behavior, worker's involvement and safety behavior. Nominal scale has been used to measure demographic profile section while the rest were using the five-point Likert Scale. For the safety climate, this study adapted the questionnaire designed by Fang et.al (2006) that consisted of four items for management commitment, four items for supervisor's and workmate's role, four items for risk taking behavior and five items for workers involvement. Meanwhile, the dependent variable of individual safety behavior consists of five items that measure the workers behavior in the work environment. All the respective independent variables of management commitment, supervisor's and workmate's role, risk taking behavior and worker's involvement recorded Cronbach's Alpha value of 0.719, 0.605, 0.791 and 0.753 respectively. While the Cronbach's Alpha value for items used to measure the dependent variable of safety behavior is 0.929.

The data was then coded and processed by using Statistical Package for Social Sciences (SPSS) Version 23. In order to describe the demographic profile of the respondents, a descriptive analysis was conducted. Besides that, a reliability test was also conducted in order to examine the data stability and consistency; and in order to answer research hypotheses, multiple regression analysis was conducted to examine which independent variable dimensions influence the dependent variable the most as well as to identify the relationship probability between involved independent and dependent variables.

Results

The descriptive statistical analysis shows that 100% of the respondents are male. The results revealed that the highest percentage of respondents is at the age category of 30-39 years old which is at 35%. While the lowest number of respondents were aged 40 and above, which is at 32%. The highest number of respondents has been working for more than 10 years which is 50% and only 7% respondent are just joining the organization which has less than 1 year of length of service at the time this study was conducted. 58% of the respondents have very good knowledge about workplace safety while the other 42% respondents have good knowledge regarding the safety at the workplace. The result also revealed that 58% of the respondents agree that they never break safety procedures at the workplace while the other 20% admitted that they have broken the safety procedures while the other 22% of the respondents admitted that they almost break the safety procedures.

Table 1
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.535 ^a	.286	.258	3.71446	1.160

a. Predictors: (Constant), mgtcommitment, workersinvolve, risktaking, svrolewmrole

b. Dependent Variable: indissafety

The result of the multiple regression analysis is shown in Table 1. The R square value is 0.286 which indicates that 28.6% of the variance in dependent variables (safety behavior) can be explained by the independent variables (management commitment, worker's involvement, supervisor's and workmate's role as well as risk taking behavior). Meanwhile, the other 71.4% of the variation can be explained by using other independent variables that are not studied in this research.

Table 2:
ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	564.351	4	141.088	10.226	.000 ^b
	Residual	1407.313	102	13.797		
	Total	1971.664	106			

a. Dependent Variable: indissafety

b. Predictors: (Constant), mgtcommitment, workersinvolve, risktaking, svrolewmrole

The ANOVA table shows the significant value ($p=0.00$). This indicates at least one independent variable in this research is the predictor to safety behavior. The strength of the significant value can be determined by F statistics value. The higher the value, the significance will be the result. F statistics value for this study is 10.226 ($p=0.00$).

As refer to coefficients table below, only management commitment has the significance value of 0.00 which is $p<0.05$. The other three independent variables of supervisor's and workmate's role, risk taking behavior and worker's involvement are not significant and above the significance values that are 0.180, 0.064 and 0.172 respectively ($p>0.05$). Therefore, only hypothesis 1 is accepted while hypothesis 2, 3 and 4 are rejected.

Table 3
Coefficients

Coefficients ^a						
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
	(Constant)	5.178	2.968		1.745	.084
1	svrolewrole	.397	.294	.147	1.351	.180
	risktaking	-.237	.127	-.197	-1.870	.064
	workersinvolve	-.327	.238	-.145	-1.376	.172
	mgtcommitment	.837	.143	.602	5.849	.000

a. Dependent Variable: indisafety

Unstandardized coefficient of β shows the relationship points between independent and dependent variables. The management commitment has the unstandardized coefficient value of 0.837 which indicates positive relationship between management commitment and safety behavior of an employee. Several interpretations can be made based on the coefficient estimates (β) derived. Firstly, an increase in the supervisor's and workmate's roles will not lead to an increase in individual safety behavior as supervisor's and workmate's roles is not a predictor for individual employee's safety behavior indicating that supervisor's and workmate's roles are not important. Secondly, an increase in risk taking behavior also will not lead to an increase in safety behavior of the employee as risk taking behavior is not a predictor for safety behavior indicating that risk taking behavior is not important. Thirdly, an increase in worker's involvement will not lead to an increase in employee's safety behavior as worker's involvement is not a predictor to employee safety behavior indicating that worker's involvement is not important. Fourthly, an increase in management commitment will increase the employees' safety behaviors by 0.84 points indicating that safety behavior of the employees can be improved by increasing management commitment regarding the safety aspects at the workplace. Lastly, an increase in all variables that are not included in the model will lead to an increase in employees' safety behavior by 5.18 points.

Discussion and Conclusion

This study practically contributes to broadening the literature regarding independent variables as well as dependent variables that are involved in this study thus such variables of management commitment, supervisor's and workmate's roles, risk taking behavior, worker's involvement and safety behavior can be clearly understood and the linkage can be determined. Thus, clarify the relationship between safety climate and employees' safety behaviors. Out of four hypotheses that are involved in this study, only one hypothesis is accepted while the other three are rejected. Although past researchers proved the correlations of these variables, the regression result shows otherwise. Supervisor's and workmate's roles, risk taking behavior and worker's involvement showed non-significance value towards employees' safety behavior. Meanwhile, management commitment has a positive significance relationship with employees' safety behavior. Hence, H1 is fully

supported while H2, H3 and H4 are not supported. Figure 2 summarizes the findings of the relationships between independent variables (management commitment, supervisor's and workmate's roles, risk taking behavior and worker's involvement) and dependent variable (safety behavior).

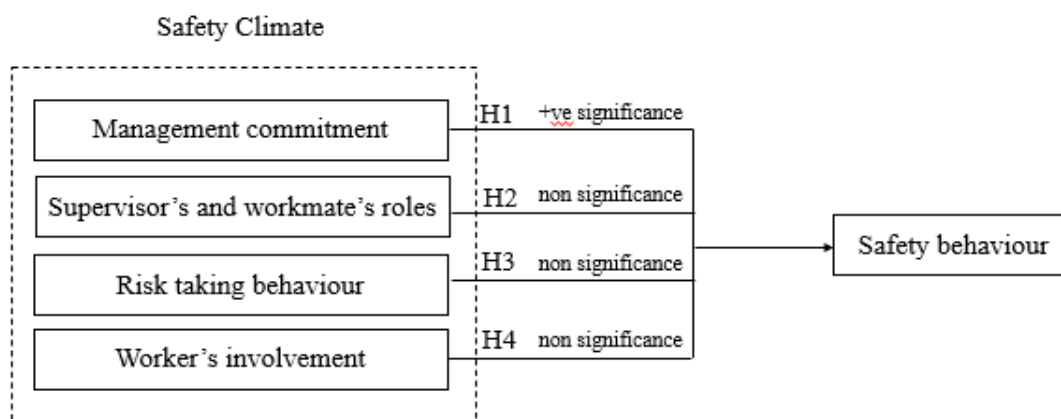


Figure 2 : Relationship framework

This study findings are consistent with the research conducted by Fogarty and Shaw (2010), in which management attitudes had direct effects on shaping individual's attitudes. Besides that, recent studies conducted by Abdullah et al (2020), Setyawan et al (2021), and Hassan et.al (2020), also found that management commitment has a positive significant relationship on safety behavior. Management commitment has a positive and significant relationship on safety behavior at this organization mainly because Company Y has succeeded in being a good example in practicing and supporting safety practices thereby influencing the employees to portray and imitate the safety behavior at the workplace.

On the other hand, past researchers (e.g., Salazar-Escoboza et al., 2020; Marin et al., 2019; Alvarez-Chavez et al., 2019; and Gutierrez et.al, 2013) found that the safety climate has a direct effect towards safety behavior. Although safety climate dimensions of risk-taking behavior, supervisor's and workmate's roles and worker's involvement used in this study are found to have non-significant relationship towards safety behavior, past researchers acknowledge that the dimensions of safety climate are still inconclusive and inconsistent, thus warrant for more empirical research to test the dimension. Hence, this study findings perhaps could contribute in helping the future researchers to have better understanding about the dimensions and the setting used in this study in studying safety climate - safety behavior relationship.

Besides that, the reason why the findings are not consistent with previous studies are firstly due to smaller sample size compared to the previous studies in which, the completed and valid questionnaires for this study is only 100. Secondly, the conflict of interest experienced by the respondents also contributes to the inconsistent findings. This is because they were reluctant to give honest answers as they do not want to disclose their grievance to the outsiders thus damaging the reputations of themselves as well as tarnish their organization's image.

Recommendation for Management

It has been proved that one of the safety climate factors which are management commitment has a significant relationship with individual safety behavior. In this study setting, management should play a vital role in ensuring the individual's safety behavior as this would lead to a higher productivity too. Regarding the study findings, the following recommendations are available for the management in order to improve the current conditions.

Improving Management Commitment. Management commitment found to have a positive significant relationship with safety behavior. Thus, the management should improve the strategy and efforts regarding the safety procedures and policies at the workplace in order to improve the safety behavior of the employees. For example, the management should clearly explain about the safety policy, procedures and rules to the employees so that they have better understanding about the workplace safety and how this safety climate could affect their safety behavior at the workplace.

Besides that, management should also encourage the employees to report any unsafe act so that hazards could be identified before occupational incidents and accidents occur in the future. Most importantly, management should allocate more for the safety budget so that safety equipment such as safety glasses and shoes, helmets, rigging equipment etc. are enough throughout the organization so that they can significantly reduce the number of accidents and achieve 'zero accident' at the end of the day.

Safety courses for both supervisors and employees could also be organized by the management. The courses should also be revised to suit the major respondents of this study. This is important in improving the employees' knowledge and skills regarding the safety procedures in carrying out their daily tasks. For example, the management should show how safety equipment can be used in accomplishing their jobs.

Limitations and Suggestions for Future Research

Due to low R square values (0.286), which reflects that the other 71.4% of the employee's safety behavior being explained by the other factors, future researchers should test for the other factors that contribute to the higher safety behavior. Besides that, this study only involved 100 maintenance and engineering department workers of Company Y in the power supply industry, future studies are advised to test this framework on a larger sample involving other industries that have higher occupational accidents and death to increase the generalizability of the findings. As the dimensions of the safety climate is still indecisive and inconclusive, more research on other potential predictors should be conducted. Besides that, the study can be more meaningful if future researchers could study the mechanisms that may affect the relationship between safety climate and employee's safety behavior by testing the potential mediators and moderators such as safety conscientiousness, safety performance, individual difference, and etc.

Conclusion

This study has been carried out towards the maintenance and engineering department employees in a selected organization of Malaysia's power supply industry. The findings provided empirical evidence for linking safety climate on the individual employee's safety behavior, thus providing support for a key theoretical proposition of the theory of planned behavior, social climate theory as well as Maslow hierarchy of need theory. This study found strong support for the direct effect of management commitment towards safety behavior suggesting the employers should put significant attention in constructing their safety protocols and procedures that may improve the management commitment. This study findings reinforce the role of management commitment on the safety behavior of the employees consistent with the theorizing in theory of planned behavior as well as social climate theory.

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