

Factors Influencing Safety Behaviour among Primary School Teachers in Kuala Nerus, Malaysia

Huinee Voon, Tengku Mohammad Ariff

ABSTRACT--- *Habitual non-compliance with policies, procedures and safety rules are believed to be the main cause of accidents as it can cause the entire system more at risk for failure. Recognising how particular facets of safety climate may shape risk behaviour will allow organizations to weigh conflicting organizational priorities as well as reducing unsafe behaviour in the workplace. This study assessed safety climate dimensions as predictors for safety compliance behaviours in defining safety climate and evaluated the perception of school teachers about the workplace safety and health system in primary schools. The objectives of this study was to explore the relationship between perceived safety climate and safety compliance behaviour among primary school teachers; and to determine the dominant factors of perceived safety climate which influence safety compliance behaviour among primary school teachers. This study used the quantitative approach by applying Nordic Safety Climate Questionnaire-50 (NOSACQ-50). The major findings of the study indicated that three independent variables peer safety communication learning, and trust in safety ability, workers' trust in efficacy of safety systems, and management safety justice influence significantly on safety compliance behaviour. On the other hand, management safety priority and ability and workers' safety commitment and management safety empowerment were least significantly related to safety compliance behaviour among the teachers. The proportion of the variance in the dependent variable is explained by the independent variables when these variables are entered into the regression analysis. The six perceived safety climate managed to explain significantly 58.7% of the variance in safety compliance behaviour. Consistent with hypothesis no.8, the factor peer safety communication learning, and trust in safety ability ($\beta = .365, p < 0.05$), workers' trust in efficacy of safety systems ($\beta = .237, p < 0.05$), and management safety justice ($\beta = .212, p < 0.05$) was positively related to perceived safety compliance behaviour. There was no support, however, for factor management safety priority and ability ($\beta = .061$), management safety empowerment ($\beta = .003$), and worker safety commitment ($\beta = .016$) was unrelated to safety compliance behaviour.*

Index Terms: Education, health, occupational, safety, workplace.

I. INTRODUCTION

Occupational safety and health is primarily concerned with the workplace and the people who work within it. In schools settings, this is strongly linked with everyday practise. Safety and health policies, procedures and daily practices are tools prepared to mitigate hazardous situations in order to foster a safe and healthy school working

environment. As schools are workplaces too, hazards and risks are present in schools, just as in any other workplace. However, schools have a distinctive workplace settings as the school environment is also comprised of non-employees, or students which their number outweigh the number of employees. Workplace-related accidents and incidents cause pain and sufferings to the victim and his/her family, and their quality of life. Countless cases of occupational related accidents and incidents are caused by a failure to apply the correct safety measures appropriately. The cost of occupational-related accidents can be exorbitant to both the accident victim and employer. Workplace accidents and incidents cause pain and suffering to the individual and his/her family. The cost of occupational-related accidents can be exorbitant to both the accident victim and employer. Some of the consequences employers have to face are recompensing sick pay, temporary replacement of sick workers, recruiting new employees or retraining workers; repairing damages inflicted on resources; allocating time for investigations; having an increase in insurance premiums or legal costs; and compensating claims made by accident victims or their family members.

A number of researches have assessed safety climate in respect to safety levels in the work environment [1], [2], evaluation of risk among workers [3] and accident frequencies [4], [5]. Safety and health is extensive topic and is continuously evolving over time, varying on social, political, economy, and technology context [6]. Most western industrial nations have law regulation and relevant government policy where the nations acknowledge and allow worker participating in matters concerning occupational safety and health [7]. Numerous researchers have described safety climate and expanded its conceptualisation. In [8] viewed safety climate as a distinct element of combination of two aspects of management commitment towards safety and workers engagement in safety. In [9], safety climate is defined as the momentary reflection of culture within shared perception of workers of organisation at a particular period. Safety climate consists of multifaceted dimensions and could be regard as key determinants of safety in workplaces [10]. Safety climate describes workers' perceptions towards work safety policies, procedures, practices and behaviours that signify the

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precedence placed on safety in relation to other organizational objectives [10]-[13].

Protecting workers against occupational illnesses and accidents has been a key aspect of health developments for centuries regardless of the type of work they perform. For that reason, safe and healthy work environment are critical to achieve higher productivity and improve worker's quality of life. The studies that have been done up till now indicates that the safety perception of employees is an imperative factor for organizations to function in a less hazardous way. In this perspective, it is vital to shed some light on the perception of safety, which is the actual basis in decision making and in enhancing the workplace safety and health system as it gives information regarding the areas of the system that needs improvement employees' safety perception when in carrying out their job. Therefore, measuring the perception of employees concerning the workplace safety and health system is crucial for assessing the level of compliance with the dimensions of the safety and health system that have been created in the school institution, as well as the ownership and responsibility of each employee in relation to their personal safety.

II. MATERIALS AND METHODS

The survey instrument contains 43 items, categorised into six constructs: (1) Management safety priority and ability (2) Management safety empowerment, (3) Management safety justice, (4) Workers' safety commitment, (5) Peer safety communication, learning, and trust in safety ability, and (6) Workers' trust in the efficacy of safety systems. The answers to items are provided on a ten-point scale: "extremely disagree," "strongly disagree," "disagree," "moderately disagree", "mildly disagree", "mildly agree", "moderately agree", "agree", "strongly agree", and "extremely agree". Teachers are therefore required to choose from the given choices of answers with regards to every item. Several items relating to personal characteristics are included in the survey consisted of age, gender, and whether the respondent is in a senior management position. The NOSACQ-50 is a suitable tool to measure safety climate as it has been translated and validated in more than 25 languages [14].

Safety compliance behaviour was described as perceived compliance to safety behaviour being displayed by teachers. A total of 11-items were measured on a similar ten-point response format from '1' to '10'. The reported reliability of this measure was .89. Similar to perceived workplace safety practices the items for perceived safety compliance behaviour was also adapted from [15]. The main reason adapting this measure was it has been widely utilised in measuring perceived safety compliance behaviour in earlier studies [16]-[19].

The study variables were measured by using the questionnaire survey which consisted of close-ended questions. It provided pre-determined options by using on a 10 point Likert Scale. Likert suggested a rating scale for the evaluation of survey participant's attitudes. Respondents were asked to choose a range of alternative options on each statement in the questionnaire survey. A Likert Scale is often used in survey design or questionnaires for getting meaningful quantitative response to restrictive closed-ended

questionnaire items. Likert also noted that descriptors could be anything, negative and positive responses are not necessary, and the number of options is open to manipulation [20].

Primary school teachers in Gong Badak, Kuala Nerus District, Terengganu were the target population for the study. The study location was five kilometres perimeter from Institut Perguruan Dato Razali Gong Badak, Campus. Sample size selection criteria used the systematic sampling>probability sampling> purposive sampling method. All respondents were of those teaching/ working in the same school and fitted the criterion of the target respondents. The study was conducted in Gong Badak, Kuala Nerus District, Terengganu, where the related literatures have showed that earlier researchers gave little attention to the area. The content validity and reliability of the questionnaire NOSACQ-50 Malay was sought. Pilot test was done to check the relevant of the questionnaire. Prior approval was sought from the Ministry/ schools for conducting the research. Written consent was taken from school teachers& employees. Respondents were assured from any kind of breach of information and codes will be used instead of their names. The information received will be treated as confidential and remain anonymous. Data analysis was conducted using SPSS Version 21 which included the reliability test, correlation analysis, and multiple regression analysis. The questionnaire was divided into six constructs with between 6-9 items in each dimension. The items were categorised into two groups, which included items that were grouped and asked in a positive way, and items that were asked in a reversed or negated way.

In this study, the reliability analysis was done through Cronbach's Alpha to check on the internal consistency for each factor. The reliability for a research study must be at least 0.7 or above [21] for high consistency. A reliability analysis was conducted on the safety climate scale comprising 50 items and 11 items from safety compliance scale. Management safety priority and ability ($\alpha = 0.893$), management safety empowerment ($\alpha = 0.865$), management safety justice ($\alpha = 0.826$), workers' safety commitment ($\alpha = 0.773$), workers' safety priority and risk non-acceptance ($\alpha = 0.456$), peer safety communication learning, and trust in safety ability ($\alpha = 0.939$), and workers' trust in efficacy of safety systems ($\alpha = 0.863$). The safety compliance behaviour scale has a ($\alpha = 0.706$). The data indicated that the items in a set were independent measures of the same concept or dimension and positively correlated to one another, therefore they are all reliable items. Cronbach's alpha showed the overall questionnaire to reach acceptable reliability, $\alpha = 0.951$. The majority of items showed to be worthy of retention, that might be resulting in a decrease in alpha if excluded. The one exception to this was construct of workers' safety priority and risk non-acceptance, which only had an alpha to $\alpha = 0.456$. As such, the construct was removed for the actual study. Cronbach's alpha showed the overall questionnaire to reach acceptable reliability, $\alpha = 0.951$.

Table 1: Reliability coefficients for each construct

Factor	Cronbach's Alpha
Management safety priority and ability	.893
Management safety empowerment	.865
Management safety justice	.826
Workers' safety commitment	.773
Workers' safety priority and risk non-acceptance	.456
Peer safety communication learning, and trust in safety ability	.939
Workers' trust in efficacy of safety systems	.863
Safety compliance behaviour	.706

III. RESULTS AND ANALYSIS

The respondents were chosen randomly from primary schools based in Gong Badak, Kuala Nerus District, Terengganu. The respondents were comprised of primary school teachers with different demographic backgrounds from several departments in the schools respectively. From the total of 270 respondents, 71 or 26.3 per cent are males and 199 or 73.7 per cent are females. There are also other demographic factors such as age, ethnicity, marital status, level of education, years of teaching, and involvement on school safety and health management system which are included in the analysis. The demographic data indicated that most of the respondents were in the age group of 46-50 with a total of 68 or 25.2 per cent. The number of respondents in the age group of 41-45 and 51-55 were 52 or 19.3 per cent and 49 or 18.1 per cent respectively. There were 41 or 15.2 per cent of respondents in the 36-40 age group while 25 or 9.3 per cent came from the 31-35 age group. Respondents in the age group of 26-30 made up 19 or 7.0 per cent of all the respondents. There were only 9 or 3.3 percent of respondents in the 21-25 age group and 7 or 2.6 per cent in the 56-60 age group. All the respondents are from Malay ethnicity 100 per cent from the total respondents.

The majority of the respondents are married with the frequency of 236 or 87.4 per cent. 26 or 9.6 per cent were single and respondents who were either divorced or widowed were 8 or 3.0 percent. Most of the respondents are Bachelor Degree holders with a total of 181 or 67 per cent, followed by Diploma holders 49 or 18.1, Masters/PhD holders 22 or 8.1 per cent, and Others qualification 18 or 6.7 per cent. Most of the respondents have 21-25 years of teaching experience with 66 or 24.4 per cent. 58 or 21.5 of the respondents have 16-20 years of teaching experience while 51 or 18.9 and had 26-30 years of teaching experience. There were 32 or 11.9 and 30 or 11.9 of respondents with 6-10 years and 11-15 years of teaching experience respectively. 26 or 9.6 respondents have 1-5 years teaching experience while only 7 or 2.6 per cent of respondents have 31-35 years old in years of teaching. Lastly, 105 or 38.9 per cent of respondents are involved in school management that deals with safety and health in the schools while the other 165 or 61.1 per cent were not involved in it.

Table 2: Demographic variables of respondents

	Frequency	Percentage
Gender		
Male	71	26.3
Female	199	73.7
Age		
21-25	9	3.3
26-30	19	7.0
31-35	25	9.3
36-40	41	15.2
41-45	52	19.3
46-50	68	25.2
51-55	49	18.1
56-60	7	2.6
Status		
Single	26	9.6
Married	236	87.4
Divorced/Widowed	8	3.0
Education		
Diploma	49	18.1
Degree	181	67.0
Master/PhD	22	8.1
Others	18	6.7
Years of Teaching		
1-5 years	26	9.6
6-10 years	32	11.9
11-15 years	30	11.1
16-20 years	58	21.5
21-25 years	66	24.4
26-30 years	51	18.9
31-35 years	7	2.6
School OSH Management		
Yes	105	38.9
No	165	61.1
Ethnicity		
Malay	270	52.9

Objective 1: To Explore the Relationship between Perceived Safety Climate and Safety Compliance Behaviour among Primary School Teachers

A total of 270 respondents participated in the survey. A total of 300 set of questionnaires were distributed to the respondents and the percentage rate of returned samples was 90 %. Table 3 showed the relationship between safety compliance behaviour with the six constructs of safety climate variables and a matrix of correlation and sample statistics of all variables were also shown in the table. This was to determine whether one variable is related to another by checking the nature, strength, direction and significance of the bivariate relationships. A Spearman correlation matrix is applied to give this information. Preliminary analyses were conducted to make sure no violation of the assumptions of normality, linearity and homoscedasticity. As for the direction of the relationship between the variables, it is presented that there is a positive correlation between all the independent variables to the safety compliance behaviour. According to the size of the value, it



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was revealed that there were relationship between variables and the strength of correlation of each variables are as follows; management safety priority and ability ($r = 0.55$) (moderate strength), management safety empowerment ($r = 0.51$) (moderate strength), management safety justice ($r = 0.59$), worker safety commitment ($r = 0.47$) (moderate strength), peer safety communication learning, and trust in safety ability ($r = 0.68$) (moderate strength), workers' trust in efficacy of safety systems ($r = 0.65$) (moderate strength)

is significant at 0.05 confidence level. This strongly indicated that there is a positive moderate correlation between the six variables to the safety compliance behaviour. Finally, the result findings of the study has indicated that worker safety commitment ($r = 0.47$) correlation is less related to safety compliance behaviour of the primary school teachers.

Table 3: Safety climate and safety compliance behaviour

Correlations							
	Management safety priority and ability	Management safety empowerment	Management safety justice	Workers' safety commitment	Peer safety communication learning, and trust in safety ability	Workers' trust in efficacy of safety systems	Safety compliance behaviour
Management safety priority and ability	1.000						
Management safety empowerment	.746**	1.000					
Management safety justice	.664**	.696**	1.000				
Workers' safety commitment	.500**	.599**	.536**	1.000			
peer safety communication learning, and trust in safety ability	.570**	.498**	.510**	.473**	1.000		
Workers' trust in efficacy of safety systems	.547**	.567**	.569**	.640**	.719**	1.000	
Safety compliance behaviour	.546**	.514**	.589**	.472**	.679**	.650**	1.000

**Correlation is significant at the 0.01 level (2-tailed).

Objective 2: To Determine the Dominant Factors of Perceived Safety Climate Which Influence Safety Compliance Behaviour among Primary School Teachers

The results are shown in the table labelled Model Summary (Table 4) under the heading R square and ANOVA (Table 5). These will tell how much of the variance in the dependent variable is explained by the model. The analysis indicates that 76.6 per cent or ($R^2 = .587$) of the variance in safety compliance behaviour. This is quite a respectable result. Since the sample tends to be small, the Adjusted R Square value of ($R^2 - .578$) in the output is to be used to give a better estimate of the true population. In this case, the six independent variables are reasonably strongly correlated ($r = .77$). In addition, statistical findings presented in Table 5 shows that the F value of 62.424 is significant at all the predictors/independent variables with ($Sig. = .000$).

Table 4: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766 ^a	.587	.578	.66551

a. Predictors: (Constant), workers' trust in efficacy of safety systems, management safety empowerment, workers' safety commitment, peer safety communication learning,

and trust in safety ability, management safety justice, management safety priority and ability

Table 5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	165.889	6	27.648	62.424	.000 ^b
	Residual	116.484	263	.443		
	Total	282.373	269			

a. Dependent Variable: Safety compliance behaviour

b. Predictors: (Constant), workers' trust in efficacy of safety systems, management safety empowerment, workers' safety commitment, peer safety communication learning, and trust in safety ability, management safety justice, management safety priority and ability

In order to evaluate which of the variables included in this study contributed to the prediction of the dependent variable, the output box labelled Coefficients to be applied

in the column Beta under Standardised Coefficients in Table 6. The R^2 of 0.578 implies that the six constructs of safety climate predictor variables explained about 58.7 % of the variance in the safety compliance behaviour, as shown in the Table 4. The Beta values indicated the largest beta coefficient is .365 (Sig.000), which is for peer safety communication learning, and trust in safety ability followed by the second highest beta .237 (Sig.001) of workers' trust in efficacy of safety systems, and third highest beta .212 (Sig.001) of management safety justice. This means peer safety communication learning, and trust in safety ability variable makes the strongest contribution to explain the

dependent variable. These three variables make the strongest unique contribution to explain the dependent variable. The three lowest beta values of .061 (Sig .350) for management safety priority and ability, .016 (Sig.777) for workers' safety commitment, and .003 (Sig.968) for management safety empowerment shows that they made the least contributions to the prediction of the dependent variable. Moreover, the R adjusted value when minus by R^2 value resulting in 0.009; when converted into percentage, the output score 0.9 %. Since the value is less than 5%, it presents that this study could be generalized to other population and be tested in other sector [22].

IV. TABLE 6: COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.836	.333		5.509	.000
	management safety priority and ability	.057	.061	.061	.936	.350
	management safety empowerment	.002	.054	.003	.040	.968
	management safety justice	.174	.052	.212	3.331	.001
	workers' safety commitment	.012	.044	.016	.283	.777
	peer safety communication learning, and trust in safety ability	.308	.052	.365	5.978	.000
	workers' trust in efficacy of safety systems	.187	.057	.237	3.310	.001

Dependent Variable: safety compliance behaviour

V. DISCUSSION

The relationship between the independent variable and dependent variables was analysed using Spearman's correlation coefficients. It had explained the relationship between safety compliance behaviour and the six facets of safety climate predictor variables. The relationship between safety compliance behaviour and peer safety communication learning, and trust in safety ability was the highest linear score where $r = 0.68$. The second highest score is found in workers' trust in efficacy of safety systems where $r = 0.65$, followed by the management safety justice construct where $r = 0.59$, management safety priority and ability where $r = 0.55$, and management safety empowerment, $r = 0.51$. Finally, the relationship between safety compliance behaviour and worker safety commitment construct was the lowest correlation where $r = 0.47$, with significant at 0.05 confidence level. The results show that peer safety communication learning, and trust in safety ability was contributed significantly to the variance in safety compliance behaviour. The results also strongly indicated that there is a positive moderate correlation between the six variables to the safety compliance behaviour.

The result demonstrates that safety climate has explained the safety compliance behaviour of the teachers. The survey was carried out among 300 teachers and received 90 per cent returned rate. Three independent variables, peer safety communication learning, and trust in safety ability, workers' trust in efficacy of safety systems, and management safety justice influence significantly on safety compliance

behaviour. On the other hand, management safety priority and ability and workers' safety commitment and management safety empowerment were least significantly related to safety compliance behavior among the teachers.

The proportion of the variance in the dependent variable is explained by the independent variables when these variables are entered into the regression analysis. The six perceived safety climate managed to explain significantly 58.7% of the variance in safety compliance behaviour. The factor peer safety communication learning, and trust in safety ability ($\beta = .365$, $p < 0.05$), workers' trust in efficacy of safety systems ($\beta = .237$, $p < 0.05$), and management safety justice ($\beta = .212$, $p < 0.05$) was positively related to perceived safety compliance behaviour. There was no support, however, for factor management safety priority and ability ($\beta = .061$), management safety empowerment ($\beta = .003$), and worker safety commitment ($\beta = .016$) was unrelated to safety compliance behaviour.

A multiple regression was run to predict safety compliance behaviour from management safety priority and ability, management safety empowerment, management safety justice, workers' safety commitment, peer safety communication learning, and trust in safety ability, workers' trust in efficacy of safety systems. These variables statistically significantly predicted safety compliance behaviour, $F(6, 263) = 62.42$, $p < .05$, $R^2 = .587$. All six variables added statistically significantly to the prediction, $p < .05$. The results of the regression indicated that the model

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explained 58.7% of the variance and that the model was a significant predictor of safety compliance behaviour.

There is an abundant of literature in relation to the worker's perceptions regarding workplace safety and health systems, which necessitates further studies employing standardized measures that allow analyses on the various organizational and context factors as a baseline for safety performance in diverse sectors and nations. To control the selection bias of respondents who were involved in the survey, a random a probability sampling method was used, hence making a loss adjustment; the use of the validated questionnaire allowed information bias to be reduced owing to the capacity of the instrument. These findings corroborates on how safety climate influences both overall safety conditions in organizations behaviours. Some safe-behaviour models such as Dejoy's [23] sequential model of self-protective behaviour, theories that safety climate is among the supports of motivation for prompting the adoption of, and compliance to, safe behaviours.

VI. CONCLUSION

It is always not keep in mind that teachers are not exposed or sustained serious risk in their profession. Adaption of safety climate measures enable us to gain insight into the occupational hazards and risks that teachers could be exposed to, especially voice disorders which is the most prevalent health problem among those who use voice as a tool in their occupation. It also plays a role in contributing to a holistic view of a safe and healthy school climate. Therefore, the influence of safety climate on safety behaviour among primary schools teachers is examined. The result findings had demonstrated that safety behaviours of the teachers were highly influenced by peer safety communication learning, and trust in safety ability followed by workers' trust in efficacy of safety systems, and management safety justice held in the schools.

According to the study objectives, the NOSACQ-50 was utilised to assess the influence of safety climate on the safety behaviour according to the perceptions of teachers based on six dimensions, which are management safety priority and ability, management safety empowerment, management safety justice, workers' safety commitment, peer safety communication learning, and trust in safety ability, workers' trust in efficacy of safety systems and the safety compliance behaviour. The questionnaire survey gave evidence of convergent and discriminant reliability for safety behaviour constructs, similar to past findings [24]. A positive significant relationship was identified between peer safety communication learning, and trust in safety ability, workers' trust in efficacy of safety systems, and management safety justice and on safety behaviour indicating that creating the necessary workplace safety and health awareness among teachers will improves teachers' safety behaviour. On the other hand, the least significant variables are management safety priority and ability, workers' safety commitment, and management safety empowerment shown those constructs has less influence to enhance safety behaviour.

Hazards and risks in the school environment can lead to exorbitant cost in rectifying damages and personal lost. Hence, the risk of incidents and accidents from occurring

due to these threats must be reduced. Paramount effort has been given to come up with many human factors related studies which the findings are widely available to support and enhance safety, and at the same time providing guidelines in reducing hazards exposure to human. An appropriate safety management system or approaches for handling risks in schools are important to safe operation in the organisation. This could be further expanded into the topic of behavioural safety approach. Critical issues may be attributed to system failure for controlling and managing safety in order to come out with useful mediums which eventually turn or lead safety objectives and programs to desired or ideal outcomes, rather than within the commitment of school personnel. With the dynamic nature of teaching nowadays, safety has to be of an importance in the schools. Keeping our schools safe must be ingrained culture as ensuring our schools safe is part of the holistic approach to ensure the success of education in this country and towards a positive school climate that helps in the development of future generations.

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