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THE EFFECT OF OWNER-MANAGER'S SAFETY LEADERSHIP AND SUPERVISOR'S SAFETY ROLE ON SAFETY PERFORMANCE IN MALAYSIA'S MANUFACTURING SMEs

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ABSTRACT

Safety leadership has been advocated as the most appropriate approach towards injury prevention. Besides, supervisor safety role is also proposed to be crucial towards good safety performance in SMEs. Henceforth, this study aimed to determine the direct impact of safety leadership (safety concern, safety policy, and safety motivation) played by the owner-managers on safety performance within the SME manufacturers in Selangor, Malaysia. Furthermore, this study also evaluated the mediating effect of supervisor safety roles towards safety leadership and safety performance' relationship. The data was collected among 165 SME manufacturing workers from 37 factories and Partial Least Square – Structured Equation Model (PSL-SEM) was performed for data analyses. The results indicated that safety leadership in terms of safety concern, safety policy, and safety motivation has significant impact on safety performance. However, supervisor safety role does not mediate the relationship between safety leadership and safety performance. These results proved importance of direct safety management by the owner-managers and supervisors towards safety performance.

Safety leadership approach delivered by the owner-managers could be the best way to improve safety performance despite all the limitation within SMEs.

Keywords: Safety Leadership, Safety Performance, Supervisor Safety, SME, Occupational Safety and Health.

INTRODUCTION

SME sector is very important towards country economic growth (Tahir et al., 2018). However, it also appear with high statistics of workplace accident in Malaysia (Khoo et al., 2011a; Surienty, 2019). It was announced that 60-90% of the total accident cases in Malaysia comes from the SME (Aziz et al., 2015; Nor Azma et al., 2016; Zulkifly et al., 2018). The low level of safety performance has been found as the cause of accidents (Shahlan et al., 2015; Surienty, 2012). The uniqueness of firm characteristic owned by the SME such as limited financial and manpower leads to the poor performance of OSH. With small organizational size, the employees are more multi-tasking, and always focus on productivity as per demanded by the employer. Cost-saving become the main agenda, thus made the employer only provides minimal resources to spend on safety issues. This situation would subsequently lead to an unsatisfactory workplace safety performance among the SMEs (Hassan et al., 2019; Mat Saat et al., 2016; Surienty, 2012).

PROBLEM STATEMENT

From day to day, occupational safety problems in manufacturing SMEs remain unsolved. Unsafe conditions and workers unsafe behaviour are the cause of accident in the SME manufacturing (Hussin et al., 2009; Mansur et al., 2011; Zakaria et al., 2012). Financial vulnerability has been called as the substantial barriers for the manufacturing SMEs in Malaysia to ensure their safety performance (Sahimi et al., 2019). Other limitations such as lack of knowledgeable personnel (Md Deros et al., 2014), low level of safety awareness (Khoo et al., 2011b), and hazardous workplace (Hong et al., 2018) are among the high-ranked of causes to this problem. To overcome the situation previous scholars have conducted intensive and extensive studies on the factors of safety performance. From the studies, safety climate has been found as the leading factor (Flin et al., 2000; Kundu, 2015; Oah et al., 2018), besides safety management practice (Subramaniam et al., 2016; Vinodkumar & Bhasi, 2010), and safety leadership (Chua & Wahab, 2017; Du & Sun, 2012; Wu et al., 2015). Safety leadership has been advocated as the most appropriate approach to improve safety performance in terms of injury reduction (Beus et al., 2016). Safety leadership has been studied within Malaysia's SME manufacturing and has been found to significantly influence safety behaviour (Zulkifly et al., 2017). On one hand, safety leadership has also been found to predict safety performance of manufacturing firms in Malaysia (Chua & Wahab, 2017).

Safety role played by the supervisors is also an essential element towards safety performance. Literature shows a significant effect of supervisor safety on overall safety performance (Lu & Shang, 2005; Lu & Tsai, 2008; Misch, 2015; Shang et al., 2015). Khoo et al. (2016) stated that supervisors need to play their roles in order to improve safety performance of SME manufacturing in Malaysia. This is also proven by a study from Fang et al. (2015) who determined that that reactive and supportive action of supervisors is associated with worker safety behaviour. Based on Social Learning Theory (Bandura, 1977), individual performance behaviour is based on the influence of the personal factors, environment factors, and cognitive factors. Safety modelling imposed by each owner-manager of SMEs, plus safety role played by the supervisor would improve safety behaviour of the SME workers and furthermore reduce workplace injuries. Thus, safety leadership approach is proposed by this research as the most appropriate solution to

elevate safety performance of the SME manufacturing despite their limitations. Their small and flat structure (Legg et al., 2015) enable the owner-manager and supervisor to exert their enforcement in ensuring safety behaviours of workers. Inspired by a previous study conducted by Shang et al., (2015), this research aimed to examine the mediating effect of supervisor safety role towards the relationship between owner-manager safety leadership and safety performance of the manufacturing SMEs.

METHODOLOGY

This section discusses the methods used for this research including the research design, framework, and also measurement.

Research Design, Population and Sampling

This is a quantitative and cross-sectional study, employing self-administered questionnaire to collect the data. The population of this study is the workers working in SME manufacturing in Selangor. Selangor is selected based on the highest workplace accident cases recorded by manufacturing sectors. A total of 286 operators has been distinguished as the population for this study. The sample size estimation in this case study was 165 respondents, determined using Kjekie & Morgan Table (Kjekie & Morgan, 1970).

Research Instrument

This research applied a self-administered questionnaire to measure safety leadership variables (safety policy, safety motivation, and safety concern), supervisor safety role, and company's safety performance. All of the items were adapted from Shang et al. (2015). The items are summarised in Table 1.

Table 1.

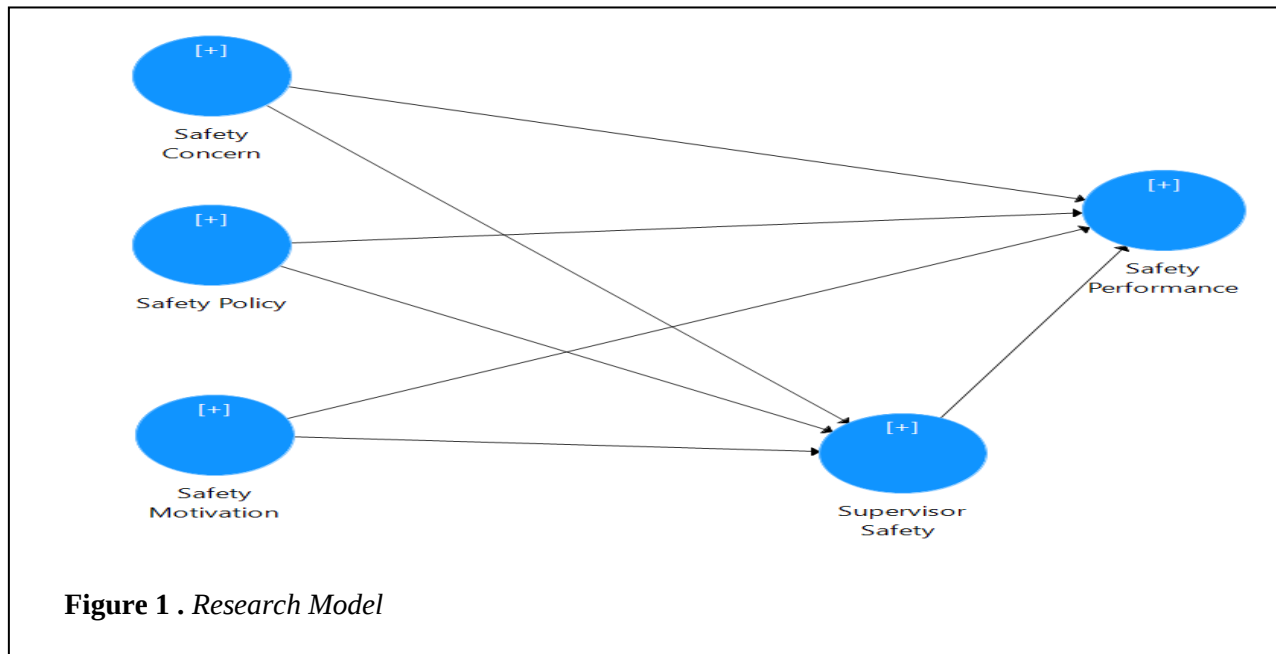
Questionnaire Items

Variables	Items	Source	Cronbach's alpha
Safety Concern	SC1- "My employer/director stress the importance of wearing personal protective equipment." SC2-"My employer/director shows interest in acting on safety policies." SC3-"My employer/director are concerned about safety improvement." SC4-"My employer/director coordinate with other departments to solve safety issues." SC5-"My employer/director show consideration for workers."	Shang et al. (2015)	0.92
Safety Policy	SP1-"My employer/ managers explain the safety policy clearly." SP2-"My employer/ managers emphasise worksite safety." SP3-"My employer/ managers have established a safety responsibility system." SP4-"My employer/ managers establish clear safety goals."	Shang et al. (2015)	0.892
Safety	SM1-"My employer/ managers reward those who	Shang et al.	0.90

Motivation	set an example in safety behaviours.”	(2015)	
	SM2-“My employer/ managers praise workers’ safety behaviours.”		
	SM3-“My employer/ managers have set up a safety incentive system.”		
Supervisor Safety Roles	SSR1-“My supervisor discusses safety issues with others.”	Shang et al. (2015)	0.91
	SSR2-“My supervisor conducts safety procedures”		
	SSR3-“My supervisor provides safety information.”		
Safety Performance	P1- “Workplace accidents are reducing compares to previous years.”		
	P2- “The numbers of equipment failure are reducing compares to previous years.”		
	P3-“The numbers of product defect and damage are reducing compares to previous years.”	Shang et al. (2015)	0.91
	P4-“The numbers of work-related injury are reducing compares to previous years.”		

Research Model and Hypothesis Development

This research’s model is as depicted in Figure 1



Based on the research model, research hypotheses have been developed and summarised in Table 2.

Table 2.

Research Hypotheses

H₁: Perceived safety leadership will significantly affect safety performance of SME Manufacturings in Selangor

H_{1a}: Perceived "safety concern" will significantly affect "safety performance."

H_{1b}: Perceived "safety policy" will significantly influence "safety performance."

H_{1c}: Perceived "safety motivation" will significantly influence "safety performance."

H_{1d}: Perceived "safety concern/caring" will significantly influence "safety participation."

H₂: Perceived "supervisor safety roles" will significantly affect "safety performance"

H₃: There will be a mediating effect of perceived supervisor safety roles on the relationship between safety leadership and safety performance.

H_{3a}: There will be an indirect effect of perceived supervisor safety roles on the relationship between safety concern and safety performance.

H_{3b}: There will be an indirect effect of perceived supervisor safety roles on the relationship between safety policy and safety performance.

H_{3c}: There will be an indirect effect of perceived supervisor safety roles on the relationship between safety motivation and safety performance.

Data Analysis Technique

This research applied Partial Least Square – Structured Equation Model (PSL-SEM) technique for data analysis. First, the measurement model was assessed by PLS Algorithms analysis. The model's reliability, construct validity, and discriminant validity were determined. Furthermore, the structural model was tested by bootstrapping the data (5000-resampled) to determine the path-coefficient values for hypothesis testing. The results are reported are discussed in the next sections.

RESULTS

The data analyses for this research were performed by using SmartPLS 3. This section reports the overall data analyses for this research.

Respondents' Demographic Profile

There were 123 persons (78.8 %) of the total respondents are male whereas the remaining are female (21.2%). Most of the respondents possess PMR/SRP or SPM/MCE level of education which is 71.8% (112 people), followed by certificate which are 4 persons (2.6%), and 4 persons hold diploma (2.6%) as their highest educational background. Furthermore, majority of the respondents are aged between 25 to 30 years old with 62 persons (39.7%), and it follows by the respondents with the age of below 25 years old, with 42 respondents (26.9%). The respondents who were less than 30 are five persons (5.5 %), while 3 of the respondents (3.3%) are 60 years old and above.

Assessment of Measurement Model

In assessing the measurement model, first, reliability and construct validity were determined by the items' loadings, average variance extracted (AVE), as well as composite reliability (CR) values (Henseler et al., 2009; Ramayah et al., 2018). Subsequently, discriminant validity was assessed using the HTMT criterion (Franke & Sarstedt, 2019; Henseler et al., 2014). The cut-off value for HTMT is 0.85 or less (the stricter criterion) or the lenient criterion, which is 0.90 or less.

Table 3.

Reliability and Construct Validity

Variables	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Safety Concern	0.883	0.915	0.683
Safety Motivation	0.924	0.952	0.867
Safety Performance	0.861	0.906	0.708
Safety Policy	0.824	0.883	0.655
Supervisor Safety	0.885	0.929	0.813

Based the results, the reliability and construct validity of the measurement model were accepted as the CR values are all above 0.7, and the AVEs are all higher than 0.5 (Joe F. Hair et al., 2020).

Table 4.

HTMT Criterion

	Safety Concern	Safety Motivation	Safety Performance	Safety Policy	Supervisor Safety
Safety Concern					
Safety Motivation	0.736				
Safety Performance	0.883	0.837			
Safety Policy	0.942	0.809	0.937		
Supervisor Safety Role	0.784	0.860	0.800	0.868	

Furthermore, the discriminant validity was assessed using the HTMT criterion (Franke & Sarstedt, 2019; Henseler et al., 2014). The cut-off value for HTMT is 0.85 or less (the stricter criterion) or the lenient criterion, which is 0.90 or less. The HTMT values are summarised in Table 4. Based on the cut-off value for HTMT, which is 0.85, the value for safety policy and safety concern is more than 0.85 (0.942). Similarly, the HTMT value for safety policy and safety performance is also above 0.85 (0.937). Therefore, two items with the lowest loading values (SP1 and SP2) for safety policy were deleted to strengthen the measurement model. Post to the deletion of items, all the HTMT values are reduced to below 0.9 thus passed the lenient criterion. The HTMT results are as outlined in Table 5.

Table 5.

HTMT Criterion (After Model Modification)

Variables	Beta Value	T Statistics	P Values	Variables	Beta Value
	Safety Concern	Safety Motivation	Safety Performance	Safety Policy	Supervisor Safety Role
Safety Concern					
Safety Motivation	0.736				
Safety Performance	0.883	0.837			
Safety Policy	0.782	0.831	0.835		
Supervisor Safety Role	0.784	0.860	0.800	0.849	
Safety Policy	0.782	0.831	0.835		
Supervisor Safety Role	0.784	0.860	0.800	0.849	

Assessment of Structural Model

Subsequently, the structural model was assessed by performing bootstrapping (5000 re-sampled) procedure (Ramayah et al., 2018). In order to determine that effect of factors on the independent variable, path coefficients, the standard errors, t-values and p-values for the structural model need to be reported (Joseph F. Hair et al., 2019). Table 6 depicted the results of for the direct effect of all variables.

Table 6.

Path Coefficient (Direct Effect)

Variables	Beta Value	T Statistics	P Values	Variables
Supervisor Safety Role	0.784	0.860	0.800	0.849
Safety Policy	0.782	0.831	0.835	
Supervisor Safety Role	0.784	0.860	0.800	0.849

Table 7.

Path Coefficient (Indirect Effect)

	Beta Values	T Statistics	P Values
Safety Concern -> Supervisor Safety -> Safety Performance	0.009	0.429	0.668
Safety Motivation -> Supervisor Safety -> Safety Performance	0.017	0.476	0.634
Safety Policy -> Supervisor Safety -> Safety Performance	0.01	0.434	0.664

Based on the results, it could be seen that safety leadership in terms of safety concern has a direct effect on safety performance with β value of 0.425 ($P < 0.05$). Furthermore, safety leadership in terms of safety motivation ($\beta = 0.311$, $P < 0.05$), and safety policy ($\beta = 0.165$, $P < 0.05$) is also found to have a direct impact on safety performance. Whereas the direct effect of supervisor safety roles towards safety performance is found to be insignificant. On the other hand, the results also revealed that there is a direct effect of safety leadership variables namely safety concern ($\beta = 0.230$, $P < 0.05$), safety motivation ($\beta = 0.438$, $P < 0.05$), and safety policy ($\beta = 0.255$, $P < 0.05$); on supervisor safety roles. Furthermore, the indirect effect of safety leadership variables, supervisor safety roles, and safety performance had also been tested. As the results, there is no significant indirect relationship found. The outcomes of the assessment are depicted in Table 7.

Effect Size

The effect size was analysed in order to complement the results of T-statistics. Moreover, the degree of differences within the relationship between study variables is important (Cohen, 2012). It is determined based on the f^2 values. The effect size is considered small if the f^2 value is at least 0.02, while the effect size is medium if f^2 is 0.15 and above. Besides, the effect size is large when the f^2 value is 0.35 and above. Table 8 shows the f^2 effect size for the relationships of all variables.

Table 8.

Effect Size

	Safety Performance	Supervisor Safety
Safety Concern	0.268	0.080
Safety Motivation	0.107	0.248
Safety Policy	0.034	0.083
Supervisor Safety	0.002	

Results in Table 8 shows the f^2 effect size of safety leadership variables towards safety performance are large (safety concern and safety motivation) and medium (safety policy). The effect size of supervisor safety role towards safety performance is too small.

R² Values

The R² refers to the percentage of variance which the independent variables explain the criterion variable (Hair et al., 2014). According to (Cohen et al., 1998), R² value indicated the magnitude of prediction power of the independent variables on the dependent variable. If the values is 2%, the variance is considered small. Furthermore, the R² value of 13% indicates a medium variance, whilst, R² of 26% is considered as a large variance explained by the independent variables. Based on the research, the R² of safety performance is 0.706 which shows that 70.6% of the variance explained by safety leadership (safety concern, safety policy, and safety motivation), and supervisor safety role. Besides, the R² supervisor safety roles is 0.688 showing that 68.8% of the variance explained by safety leadership variables. Furthermore, both of the R² values are large. Table 9 summarised the R² values for this research.

Table 9.

Prediction Power (R²)

	R ²	Adjusted R ²
Safety Performance	0.706	0.699
Supervisor Safety	0.688	0.682

SUMMARY AND DISCUSSION

This paper examined the effect of safety leadership variables, namely safety concern, safety policy, and safety motivation towards safety performance within manufacturing SME in Selangor, Malaysia. Based on the results, significant effect of safety concern, safety policy, safety motivation on safety performance are found. The strongest effect is found between safety concern and safety performance based on β -value. This results matched with Shang et al. (2015) who determined the significant effect of the same leadership variables on safety performance in container stevedoring operations. On the other hand, Zulkifly et al. (2017) also determined the significant influence of safety leadership in terms of safety concern on safety behaviour performance in Malaysia's manufacturing. Besides, this research results found that perceived safety leadership variables by the owner-manager of SMEs have a large impact on their supervisor safety roles. Moreover, this research found a large influence of all safety leadership variables on safety performance as well as supervisor safety roles within the SME manufacturing context, which is a new finding in OSH area.

However, the results also revealed that supervisor safety roles within SME manufacturing is neither influencing the safety performance nor mediate the relationship between the safety leadership variables and safety performance. This is contradicted with previous study (Shang et al., 2011, 2015). Table 10 summarised the results of this research.

Table 10.

Summary of Hypothesis Results

H ₁ : Perceived safety leadership will significantly affect safety performance of SME Manufacturings in Selangor	
H _{1a} : Perceived "safety concern" will significantly affect "safety performance."	Accepted
H _{1b} : Perceived "safety policy" will significantly influence "safety performance."	
H _{1c} : Perceived "safety motivation" will significantly influence "safety performance."	
H _{1d} : Perceived "safety concern/caring" will significantly influence "safety participation."	
H ₂ : Perceived "supervisor safety roles" will significantly affect "safety performance"	Rejected
H ₃ : There will be a mediating effect of perceived supervisor safety roles on the relationship between safety leadership and safety performance.	
H _{3a} : There will be an indirect effect of perceived supervisor safety roles on the relationship between safety concern and safety performance.	
H _{3b} : There will be an indirect effect of perceived supervisor safety roles on the relationship between safety policy and safety performance.	Rejected
H _{3c} : There will be an indirect effect of perceived supervisor safety roles on the relationship between safety motivation and safety performance.	

As explain earlier, the SMEs appear to be for informal in terms of their organisational structure which enables direct communication between the owner-managers and the employees of all position levels. The unique and more uncomplicated structure makes employees perform similar tasks regardless of whether they are operators or supervisors. In other words, the owner-managers act as the safety and health officer and owner-managers in SMEs manage safety by themselves (Wang et al., 2018). Therefore, safety leadership of the owner-managers with their visibility at workplace impose a direct impact on companies' safety performance without mediated by supervisor safety roles. Furthermore, perceived management support also has found to impose a direct effect on SMEs' non-financial performance (Lo et al., 2016). Therefore, the safety leadership roles played by the owner-managers of the SMEs lead the supervisor to play similar roles within the firms, as seen in the research results. This situation showed that the supervisor roles only appear as the mirror effect on the management safety leadership and do not affect directly to safety performance.

CONCLUSION

In conclusion, this study results had interestingly revealed that safety leadership variables, specifically safety concern, safety policy, safety motivation had a large effect on firms' safety performance among the SMEs manufacturing in Selangor, Malaysia. Furthermore, these variables also imposed a greater influence on supervisor safety roles within those SMEs as compared to the previous study (Shang et al., 2015). The results of this study could be a piece of additional empirical evidence to the scholars of OSH research's area, especially in area related to safety leadership. It is also hoped that the results of this research could become an initiative in fostering alternative solutions for involving parties in order to elevate OSH safety performance among the SMEs in Malaysia through inculcating safety leadership behaviour among the owner-managers. This research has been conducted on selected SME manufacturers in Selangor, Malaysia. Therefore, the results are subjected to limited generalisation. It is suggested that this study applied mix-method technique in data collecting procedures to improve the response quality and rigorousness. It is also suggested that this research is replicated to other SMEs throughout Malaysia to increase the generalisation capability.

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