

The Role of Safety Leadership and Safety Knowledge in Improving Safety Performance through Safety Motivation

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Abstract

This research uses safety motivation as a mediating variable to test the effect of safety leadership and safety knowledge on safety performance. This research uses a quantitative methodology. The population of this study was 235 workers of PT Sumber Segara Primadaya PLTU Cilacap. The non-probability sampling approach was used together with the total sampling strategy, resulting in 235 samples. Partial Least Squares analysis was used as a data analysis method for this study. Analytical calculations at a significance level of 5% showed that safety performance was positively and significantly be affected by safety leadership and safety knowledge. Safety motivation is positively and significantly be affected by safety leadership and safety knowledge, and the safety motivation variable can mediate the relationship between safety performance and safety leadership as well as between safety knowledge and safety performance.

Keyword : Safety Leadership, Safety Knowledge, Safety Performance, Safety Motivation.



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1. INTRODUCTION

Workplace security is an issue involving individual and organizational variables, such as motivation, knowledge level, and leadership (Basahel, 2021). Although there have been significant advances in construction safety over the past few decades, major accidents and Construction workers continue to sustain injuries, especially those involved in electrical building projects (Hallowell, 2018). Since contact with electrical cables, wires, transformers, and electric currents on construction site machinery and equipment can result in major work mishaps like electric shocks in electrical construction and upkeep projects, these sorts of ventures have tall dangers (Zohar & Polachek, 2014).

Protecting worker safety in the workplace is a primary concern. In both industrialized and underdeveloped nations, work accidents have become a significant problem (Subramaniam et al., 2023). Although various efforts have been made to improve The management system for Occupational Safety and Health (OHS), work mishaps at the Cilacap PLTU still occur frequently (Putra et al., 2022). The company is still trying to lessen the number of workplace mishaps in order to improve occupational health and safety. For example, OHS training is carried out at all levels, including management elements. In addition, new innovations continue to be made to reduce work accidents through the use of OHS technology (Abeje & Luo, 2023). The two most important aspects OHS in the workplace (Ardiningrum et al., 2023). Work accidents will increase if there are no laws regarding occupational health and safety (Rahman et al., 2023).

Performance that depends on a person's safety-related behavior is known as safety performance (Kamilah et al., 2021). Proactive or reactive actions are taken to improve safety performance. Reactive efforts are efforts made after an incident occurs, while proactive efforts are efforts made to stop an incident from occurring (Subramaniam et al., 2023). Neal & Griffin stated in (Kamilah et al., 2021) that safety engagement and compliance combine to produce safety performance. Safety participation is employee behavior to

engage in safety activities or safety behaviors, while safety compliance is safety performance performed by staff members to ensure safety.

Leadership is stated as a key element of modern workplace safety and plays a major part in keeping up organizational solidness (Subramaniam et al., 2023). Based on (Subramaniam et al., 2023), safety the method by which safety leadership is implemented is leadership is the procedure where leaders inspire their followers to meet the objectives of organizational safety. There are two methods for assessing how leaders influence organizational safety. The second, however, looks at leadership that is unique to safety results in safety problems, the first examines all leadership actions collectively (Subramaniam et al., 2023). Because it has a major affect on safety performance and is focused on leadership becomes interesting (Draghici et al., 2022). Safety performance is positively influenced by safety leadership, according to several studies (Draghici et al., 2022; Quansah et al., 2023; Wang et al., 2023; Xue et al., 2020). This is different from (Sadili, 2024), which shows that the performance of safety is not affected by safety leadership.

The degree of worker awareness of occupational safety procedures is indicated by safety knowledge (Ansori et al., 2021). The company's safety measures and safety knowledge are directly associated (Kamilah et al., 2021). Employees with safety knowledge will be more conscious of hazardous situations, which is crucial in lowering workplace mishaps and influencing safety performance (Kamilah et al., 2021). Maulidy and Ratnawati's research (Maulidy & Ratnawati, 2023) revealed a connection between safety performance and safety knowledge, where Workers with greater expertise showed superior safety performance compared to employees with lower levels of knowledge. However, research by (Dhani et al., 2022) and (Fatika Sari, 2023) showed that safety performance was not influenced by safety knowledge.

In the research paradigm, safety motivation serves as a mediator. Employees' desire to implement safety measures in the workplace is known as safety motivation (Ansori et al., 2021). To improve employee safety performance, safety leadership can be a useful tool to encourage employees to act in a safe manner (Basahel, 2021; Subramaniam et al., 2023; Wang et al., 2023). The connection between safety performance and safety knowledge can be safety motivation as a mediator, according to the findings of (Maulidy & Ratnawati, 2023). Thus, it may be worthwhile to revisit studies discusses how safety performance is affected by safety motivation.

2. METHOD

This study employs a quantitative approach using non-probability sampling with the census method (Suliyanto, 2018). The population in this study amounted to 235 people, excluding leaders, so the quantity of responders who were sampled was 235 people. With the help of the company's internal management, questionnaires were shared to employees as part of the data collection technique. The questionnaire was created using a 5 point Likert scale. The statements used for measurement were taken from (Basahel, 2021), especially those related to the variables of safety leadership (16 items), safety knowledge (6 items), safety motivation (6 items), and safety performance (10 items). SEM-PLS was used in the analysis method with the help of SmartPLS 3. Respondent profiles and sociodemographics include length of service, marital status, education level, age, and gender.

3. RESULT

A total of 235 employees of PT Sumber Segara Primadaya PLTU Cilacap participated in this study as respondents. The results of the analysis obtained from the calculation of the demographics of the respondents showed that male employees dominated the gender of

the respondents. Employees aged 31-40 years were respondents with the majority educational background. Graduates were respondents with the majority educational background. The marital status of respondents was dominated by individuals who were married. The most common length of service of respondents was more than five to ten years. Considering the analysis's findings, respondents had the same age range.

Structural Model Analysis

The result of the analysis demonstrates that safety leadership and safety knowledge have an influence of 48.6% on safety motivation, with an R square value of 0.486. However, the safety performance variable is impacted by safety expertise and leadership, safety knowledge and safety motivation by 74.7%, based on the R square value of safety performance of 0.747.

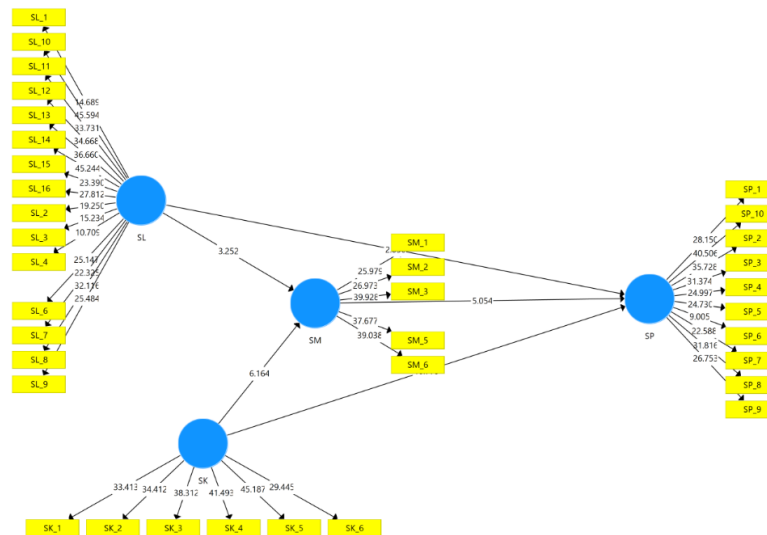


Figure 1. Outer Model.

Convergent Validity

According to Ghazali & Hengky Latan (2020), each statement item with a loading value for factors of 0.60 or more is considered to have quite strong validity. All of these statement items are considered authentic because, according to the test results in Table 1, each has a value higher than 0.60.

Table 1. Loading Factor Test Results

Variable		Loading Factor
Safety Leadership		
SL1	I know that my boss gives trust to employees	0,675
SL2	I understand that my supervisor rewards those who exemplify safety behavior.	0,717
SL3	I know that my supervisor places great importance on employee safety incentive systems.	0,654
SL4	I am aware that my Supervisor has set up a safety incentive system.	0,601
SL6	I understand that my Supervisor encourages employees to provide safety suggestions.	0,787
SL7	I know that my supervisor encourages employee participation in safety decision making.	0,776

Variable		Loading Factor
SL8	I know that my supervisor explains the safety mission clearly.	0,833
SL9	I know that my supervisor emphasizes safety in the workplace	0,822
SL10	I know that my supervisor has established a safety accountability system	0,862
SL11	I know that my supervisor sets clear safety goals	0,851
SL12	I know that my supervisor emphasizes the significance of wearing individual defensive hardware	0,798
SL13	I know that my supervisor expresses interest in acting on security approaches	0,857
SL14	I know that my supervisor is concerned about improving safety	0,856
SL15	I know that my supervisor coordinates with other departments to resolve security issues	0,786
SL16	I know that my supervisor shows concern for employees	0,818
Safety Knowledge		
SK1	I know how to do my work securely	0,813
SK2	I know how to utilize security gear and standard work strategies	0,839
SK3	I know how to preserve or progress work related wellbeing and security	0,839
SK4	I know how to diminish the chance of accidents and occurrences within the work environment	0,871
SK5	I know all the dangers associated with my work and the safety measures to require when doing my work	0,869
SK6	I know what to do and when to report any potential dangers in my working environment	0,814
Safety Motivation		
SM1	I understand the importance of keeping up security at all times	0,786
SM2	I understand that workplace security may be a exceptionally critical issues	0,799
SM3	I understand that efforts need to be made to reduce workplace mishap and incidents	0,865
SM5	I understand the importance of encouraging others to utilize secure hones	0,821
SM6	I understand the importance of promoting safety programs	0,835
Safety Performance		
SP1	I know how to utilize all security gear essential to do my work	0,788
SP2	I know that I have done my work securely	0,842
SP3	I know that I have taken after the right security and methods whereas doing my work	0,818
SP4	I know that I must ensure a level of safety while doing my work	0,821
SP5	I know the importance of always following all safety rules and methods whereas doing my work	0,795
SP6	I know the importance of helping my associates when they are working in hazardous or perilous conditions	0,618

Variable		Loading Factor
SP7	I always notify management of any safety concerns in my company	0,802
SP8	I strive to move forward working environment security	0,814
SP9	I volunteer to perform errands or excersises offer assistance progress working environment security	0,819
SP10	I empower my associates to work securely	0,856

Reliability and Validity Test

Table 2 shows the validity and reliability results tests. The analysis's conclusions demonstrate the Cronbach Alpha and Composite Reliability values of each variable are more than 0.70. Each variable in this study has an AVE value of more than 0.50, indicating that the variable is considered valid and reliable.

Table 2. Results of Construct Reliability and Validity Testing

	Cronbach's Alpha	rho A	Composite Reliability	AVE
SL	0.954	0.959	0.959	0.614
SK	0.917	0.917	0.936	0.708
SM	0.880	0.884	0.912	0.675
SP	0.937	0.941	0.946	0.640

Hypothesis Testing

The following table displays the findings of the hypothesis tests used to confirm the direct effect between the variables:

Table 3. Hypothesis Test Results

	Original Sample (O)	T Statistics (O/STDEV)	P Values	Results
SL -> SP	0.088	2,056	0.040	Hypothesis 1 accepted
SK -> SP	0.558	10,779	0,000	Hypothesis 2 accepted
SM -> SP	0.314	5,054	0,000	Hypothesis 3 accepted
SL -> SM	0.254	3,252	0.001	Hypothesis 4 accepted
SK -> SM	0.508	6,164	0,000	Hypothesis 5 accepted

As indicated by the p-value <0.05 and the original sample yielding positive values, the analysis findings represent that safety motivation, safety leadership, and safety knowledge have a favorable and significant impact on safety performance. Furthermore, a p-value below 0.05 and the positive value of the original sample indicate that safety leadership and safety knowledge have a positive and substantial impact on safety motivation.

Table 4. Specific Indirect Effects Test Result

	Original Sample (O)	T Statistics (O/STDEV)	P Values	Results
SL->SM-> SP	0.080	3,099	0.002	Hypothesis 6 accepted
SK->SM-> SP	0.160	4,240	0,000	Hypothesis 7 accepted

The indirect influence analysis's findings further demonstrate that safety motivation can act as a mediator in the interaction between safety leadership and safety performance. Other results, with a p value <0.05 and positive results in the original sample, the analysis's findings also demonstrate that safety motivation can mediate the connection between safety knowledge and safety performance.

4. DISCUSSION

Safety Leadership and Safety Performance

The outcomes of the analysis show that the safety performance of PT. Sumber Segara Primadaya PLTU Cilacap is positively and significantly influenced by safety leadership. This is indicated by the level of worker safety at PT. Sumber Segara Primadaya PLTU Cilacap, where workers generally comply more with safety procedure rules when their superiors care and are dedicated to the company's work safety (Agustina et al., 2019). Adopting a safety-focused leadership style can result in a safer workplace culture, fewer accidents, and higher operational efficiency (Rusdiana, 2020). Leaders can set an example for their employees by demonstrating a commitment to safety and providing the necessary support and training to increase understanding of the significance of safety in the workplace (Deonissa et al., 2024). To encourage higher staff safety performance, management at PT. Sumber Segara Primadaya PLTU Cilacap also emphasizes a clearer accountability system and safety targets.

Therefore, to improve workplace outcomes, organizations need to focus on developing leadership qualities that support safety (Dhiman et al., 2023). As leaders invest in them, workers are likely to rely on them, which requires safe working conditions. The results of this investigation align with research highlighting the contribution of safety leadership to improving worker safety performance Draghici et al., (2022), Quansah et al., (2023), and Xue et al., (2020).

Safety Knowledge and Safety Performance

The analysis's conclusions demonstrate that safety performance is strongly and favorably impacted by safety knowledge. This is evidenced by the fact that businesses that employ individuals with higher skills will earn more money. More work experience will make employees more skilled in their jobs (Audrey et al., 2023). One action that businesses can take is to pay more attention to the welfare of their workers while they are working (Hendrayani, 2020). There will be a greater sense of responsibility when an employee has good knowledge and is motivated to ensure safety (Bautista-Bernal et al., 2024). This is evidenced by the level of expertise possessed by the staff of PT. Sumber Segara Primadaya PLTU Cilacap who are able to understand the hazards in their work and how to take the necessary safety measures to reduce the possibility of work accidents. The analysis's findings indicate that workers know the safety measures that must be taken at work. The findings of this investigation are confirm the result from Ansori et al., (2021), Kamilah et al., (2021), and Maulidy & Intan Ratnawati (2023) who found that safety performance increases along with knowledge about safety.

Safety Motivation and Safety Performance

The outcomes of the research show that safety performance is positively and significantly influenced by safety motivation. Employee compliance in improving safety performance will increase if they are inspired to place safety in the workplace as a higher priority. According to (Smith et al., 2020) companies that can improve employee safety performance, including the use of appropriate and effective personal protective equipment, can also increase employee safety motivation. Workers at PT. Sumber Segara Primadaya have adopted safety protocols by wearing PPE when carrying out their duties, especially for those who have direct contact with flammable and hazardous equipment.

By enforcing the rules according to safety protocols, PT. Sumber Segara Primadaya places a high priority on the importance of safety motivation for staff members. In addition,

the management of PT. Sumber Segara Primadaya provides OHS training values to staff members, emphasizing the need to help coworkers in dangerous situations (Dhani et al., 2022). These results indicate that employees of PT Sumber Segara Primadaya PLTU Cilacap have realized the importance of initiatives to minimize the level of mishaps in the workplace. The discoveries of this research are in line with the considered of Basahel (2021), Ansori et al., (2021), Dhani et al., (2022), Maulidy & Intan Ratnawati (2023), and Subramaniam et al., (2023) which found that employee safety performance increased along with safety motivation.

Safety Leadership and Safety Motivation

The analysis show that safety motivation is positively influenced by safety leadership. According to this study, one of the elements that causes safety motivation is safety leadership. Employees at PT Sumber Segara Primadaya PLTU Cilacap are more motivated to understand the importance of efforts to reduce work accidents because they realize that their superiors have implemented a safety system and operate in accordance with safety policies. The results found in this study are in line with research conducted by Basahel (2021) and Subramaniam et al., (2023) which found that safety motivation will increase in proportion to the quality of safety leadership.

Safety Knowledge and Safety Motivation

The analysis's conclusions demonstrate that safety motivation is positively and significantly influenced by safety knowledge. Attempts to improve comprehension of the importance of safety for oneself, the environment, and the business indicate safety expertise. Workers can be aware of work safety performance by being aware of potential risks and incidents that may occur in the workplace. Employees who understand how important safety will know how to carry out their duties in a secure way, which will motivate them to make safety their top priority (Deonissa et al., 2024).

This study shows that one of the elements that influences safety motivation is safety knowledge. Employees are aware of the importance of efforts to reduce work accidents because they have learned ways to lower the possibility of mishaps while working. In addition, workers are aware of the risks associated with their work and have been taught the necessary safety measures. The results of this investigation align with the studies of Maulidy & Intan Ratnawati (2023) and Subramaniam et al., (2023), which found that safety motivation increases with safety knowledge.

The Mediation Role of Safety Motivation in the Relationship between Safety Leadership and Safety Performance

Considering the outcomes of the analysis, it states that safety motivation is capable of moderating the impact that safety leadership has on the safety performance of employees of PT Sumber Segara Primadaya PLTU Cilacap. This shows that safety motivation is able to strengthen the relationship indirectly so that safety leadership is stated to have an indirect influence on safety performance through safety motivation. Leaders who build a good safety system can increase safety motivation because employees know the importance of efforts to reduce accidents in the workplace so that they can encourage employees to work safely. The results of this investigation align with studies showing that safety motivation has an indirect impact on safety leadership and safety performance (Basahel, 2021; Subramaniam et al., 2023; Wang et al., 2023).

The Mediation Role of Safety Motivation in the Relationship between Safety Knowledge and Safety Performance

The results of the analysis show that the effect of safety knowledge on the safety performance of employees of PT Sumber Segara Primadaya PLTU Cilacap can be mediated by safety motivation. This shows that The connection between safety knowledge and safety motivation serves as an indirect mediator of safety performance. Based on the results of the study, workers understand how to lower the risk of workplace accidents. This encourages workers to work safely by increasing their motivation to learn initiatives to

reduce work accidents. The study's findings are consistent with previous research (Maulidy & Ratnawati, 2023) which shows an indirect connection between safety motivation and safety performance and knowledge.

5. CONCLUSION

This study emphasizes the importance of improving safety performance in PT Sumber Segara Primadaya PLTU Cilacap personnel through safety leadership and education. Previous research supports this Draghici et al., (2022) and Subramaniam et al., (2023), and it suggests that safety motivation can be enhanced through safety leadership and understanding Maulidy & Intan Ratnawati (2023) and Basahel (2021). The study suggests that the connection between safety knowledge and leadership may be influenced by safety desire or indirect influence. Further research is needed to understand the overall impact of these variables.

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