The Role of Safety Culture in Shaping Port Workers' Safety Behaviour

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ABSTRACT

The port industry is recognized as one of the most hazardous work environments globally, with a high incidence of workplace accidents and injuries. This necessitates a robust safety culture to ensure the well-being of port workers. Safety culture refers to the shared values, beliefs, and practices regarding safety within an organization, and it plays a crucial role in shaping safety behavior among employees. Safety behavior encompasses the actions and practices of workers that contribute to maintaining a safe work environment. Port workers face occupational hazards that impact workplace safety due to inadequate safety measures, insufficient training, and lack of management commitment. This study examines the impact of safety culture on workplace safety behaviour among port workers in Malaysia. Using a cross-sectional design, 86 employees participated through structured questionnaires. Data analysis through SPSS (Descriptive Analysis, Pearson Correlation, and Multiple Linear Regression) found that safety training ($\beta = 0.612$, $p < 0.001$), safety motivation ($\beta = 0.354$, $p = 0.005$), and management commitment ($\beta = 0.278$, $p = 0.021$) significantly influence safety behaviour. The results suggest that a strong safety culture and comprehensive training enhance adherence to safety protocols, reducing workplace incidents. Recommendations include improving safety training, fostering management commitment, and strengthening safety motivation to ensure a safer work environment.

Keywords: safety culture, safety behaviour, port workers, management commitment, safety training

INTRODUCTION

An organization's attitudes, beliefs, perceptions, and values are frequently reflected in its safety culture. The focus of safety behaviour is on an individual's risky work habits or "human error." One idea connected to the organisational environment that affects risk-related organisational behaviours is safety culture. The attitudes and behaviours of the employees have an impact on these activities. By lowering the frequency of workplace accidents and averting high-severity incidents, a safety culture at work aims to increase occupational safety (Ahamad et al., 2022). There are a growing number of workplace accidents, workplace safety is still a topic of attention in the port industry. This rising number was the product of industrialization's quick economic expansion. According to estimates from the International Labour Organisation, occupational accidents and diseases related to the workplace claim the lives of over 7,500 people daily. Each year, this figure is responsible for almost 2.78 million deaths. Most nations in the world have experienced an increase in occupational accidents (Sakharuk et al., 2019).

The entire expense of work-related accidents, diseases, damages, and injuries is high and can be compared to the tip of a large iceberg. Many academic disciplines frequently use the idea of an iceberg. Heinrich (1941) is a pioneering researcher in this field. According to his research, an employer should pay four times as much for accident-related injuries as they would for compensation and medical expenses. Safety culture and safety behavior are critical components in ensuring the safety and well-being of workers in high-risk industries, including ports. In summary, the interplay between safety culture and safety behavior is critical in the port industry. Strengthening safety culture through targeted interventions and management support can lead to significant improvements in safety behavior, thereby reducing workplace accidents and promoting a safer working environment for port workers.

Problem Statement

Ports are recognized as hazardous environments where safety culture plays a critical role in shaping the safety behavior of workers. Despite the importance of safety culture, there is a significant gap in understanding how various dimensions of safety culture influence port workers' safety behavior specifically. The port industry is one of the most hazardous industries worldwide, with increasing workplace accidents. Ports and docks present unique complexities and constraints that affect safety practices. (Amirah, et al., (2020); Corrigan, et al., (2019). Human behavior is a major factor in the occurrence of accidents, necessitating effective safety training and management systems.(Xing, et al.,(2012); Mallam,et al., (2019). There is a scarcity of focused research on the specific complexities and shared processes within port environments (Amirah, et al., (2020); Corrigan, et al., (2019). While safety culture has been studied in other industries, its specific dimensions and their impact on port workers' safety behavior need further exploration.(Sudiarno, et al.,(2021); Xi, et al.,(2025). Management Commitment and Training are identified as critical variables in promoting safety culture, yet their practical implementation in ports requires validation.(Amirah, et al., 2020). To address these issues, it is essential to develop and implement effective safety training programs, improve supervision and management support, and foster a culture of safety awareness and accountability among port workers according to (Berglund, 2020).

LITERATURE REVIEW

A robust safety culture significantly reduces the frequency of incidents in high-risk industries. Studies have shown that industries with a strong safety culture experience fewer incidents compared to those with a weak safety culture (Asif, et al.,2022). Safety culture directly influences workers' safety behavior. In the oil and gas industry, a significant relationship exists between safety management, safety participation, and safety compliance (Ehiaguina, et al.,2024). Similarly, in the construction industry, safety culture interventions positively impact safety behavior and culture (Kurakaew, & Hadikusumo, 2025).

Several important conclusions have been drawn from earlier research on the connection between port workers' safety behaviour and safety motivation. Higher safety motivation is linked to fewer accidents, as evidenced by the large negative correlation between safety motivation and occupational accident rates. People who are highly motivated to prevent accidents are more likely to adopt safety behaviours, and a favourable safety climate motivates employees to follow workplace safety regulations (Bayram et al, 2022). Furthermore, Ansori et al., (2021) stated that safety knowledge and motivation mediate the relationship between safety climate and behaviour while safety knowledge primarily influences compliance, motivation affects both compliance and participation. Both management commitment and safety training are crucial antecedents of workers' safety behaviour underscoring their importance in influencing safety practices (Amirah et al., 2024).

Workers who receive sufficient safety training are more likely to participate in safe behaviours at work, according to research by Vinodkumar & Bhasi, (2010), which demonstrated a substantial positive association between safety training and safety behaviour. Guo et al., (2016) also highlighted this relationship, demonstrating that safety conduct acts as a mediator between safety training and safety performance. Next, poor safety culture in the organization. A culture of recklessness and lack of accountability can prevail, making it difficult to improve safety behaviour among port workers. Inadequate reporting and monitoring because there may be inadequate reporting and monitoring of work-related injuries and diseases, making it difficult to identify and address safety issues effectively. To address these issues, it is essential to develop and implement effective safety training programs, improve supervision and management support, and foster a culture of safety awareness and accountability among port workers according to (Berglund, 2020). Additionally, Shaikh et al., (2021) found that safety training reduces the frequency of unsafe behaviours. Workers who participated in safety training programs exhibited fewer violations of safety norms compared to those who did not receive such training. This study also revealed that safety training is associated with more positive attitudes towards personal protective equipment (PPE), better perceptions of safety climate, and higher perceptions of behavioural control, all of which mediate the relationship between safety training and the reduction of unsafe behaviours. Workers may perceive higher safety risks due to the high-risk nature of their jobs. Fatigue and high workload can also affect the perception of safety risks. Fatigue workers may perceive more safety risks due to decreased attention and focus. Safety Culture are an important role when the safety culture within the organization can influence how safety practitioners perceive safety risks. Reporting and monitoring the inadequate reporting and

monitoring of work-related injuries and diseases can make it difficult to identify and address safety issues effectively, leading to varying perceptions of safety risks. These factors can contribute to differences in the perception of safety risks among safety practitioners in the port sector (Cem, 2019).

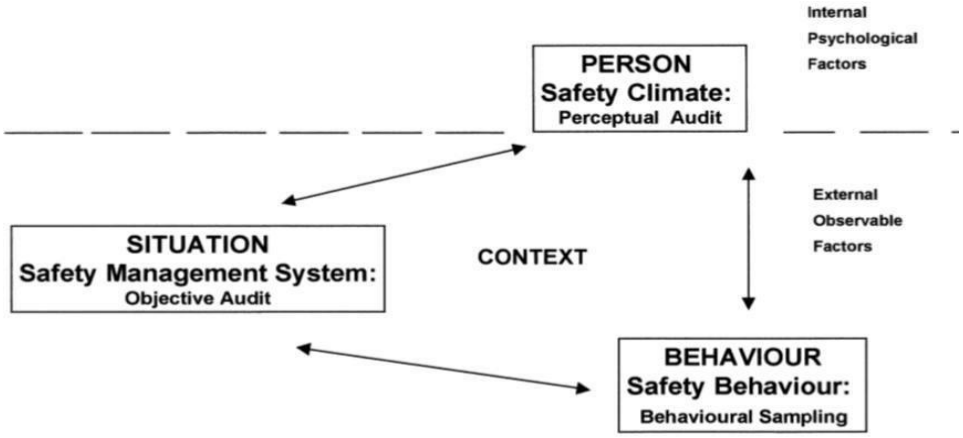

Figure 1 shows that Theory Reciprocal safety culture.

Bandura's model of reciprocal determinism, which highlights the dynamic interplay between personal, behavioural, and environmental factors, was adapted by Cooper and Phillips (1995) to conceptualize the concept of safety culture. This adaptation introduced a framework that facilitates the assessment and improvement of safety culture by breaking it into three interconnected components internal psychological factors, observable safety-related behaviours, and objective situational features.

Hypothesis 1:

Ho: There no significant between management commitment towards the safety behaviour of port workers.

H1: There is a significant between management commitment towards the safety behaviour of port workers.

Hypothesis 2:

Ho: There no significant between safety training towards the safety behaviour of port workers.

H1: There a significant between safety training towards the safety behaviour of port workers.

Hypothesis 3:

Ho: There no significant between safety motivation towards the safety behaviour of port workers.

H1: There a significant between safety motivation towards the safety behaviour of port workers.

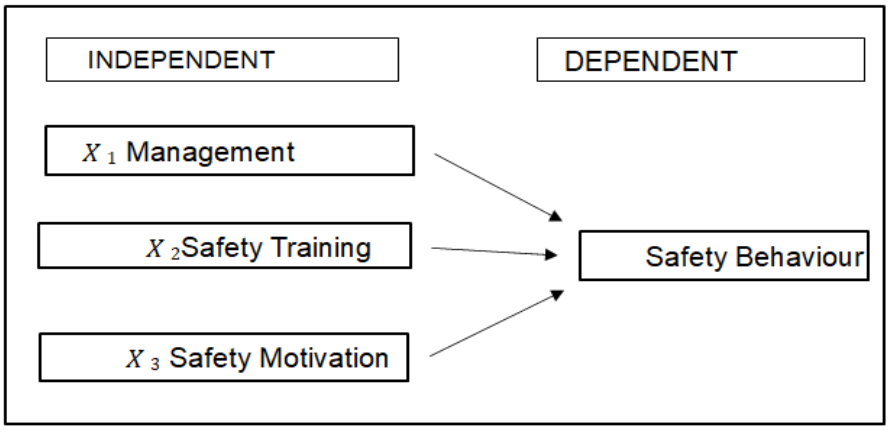

Figure 2 Conceptual Framework.

METHODOLOGY

In research, selecting an appropriate population and sampling method is crucial to ensure the validity and generalizability of findings. For this study on port workers, the total workforce comprised 106 employees. Referring to the Krejcie and Morgan sample size table, a sample of 86 workers was determined to be sufficient to meet the study's requirements. While the full workforce of 106 employees was initially considered, a sample size of 86 provides reliable and meaningful insights, offering a representative reflection of the larger group. Data were collected through questionnaires and surveys. This section included six questions related to worker safety, measured using a five-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). The Likert scale allowed respondents to express varying levels of agreement across categories: Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. The questionnaire items were adapted and adopted from previous studies (Vinodkumar et al., 2010; Zulkifly et al., 2020; Kao et al., 2019; Lu & Yang, 2010). The use of SPSS in this research proved instrumental in uncovering patterns and relationships among the variables studied. Its efficiency in organizing and processing large amounts of data ensured that the findings were not only robust but also actionable. By offering a reliable platform for data validation and result interpretation, SPSS played a key role in enhancing the study's credibility and ensuring that its conclusions could inform practical applications. Moreover, SPSS's versatile features enable researchers to manipulate data across various formats, conduct comprehensive statistical tests, and visualize trends through its array of analytical tools (Lingard et al., 2021).

RESULT

Characteristics	Frequency	Percentage
Gender		
Male	60	69.8
Female	26	30.2
Total	86	100.0
Age		
18-25 Years	46	53.5
26-35 Years	17	19.8
36-45 Years	11	12.3
46-55 Years	12	14.0
Above 55 Years	0	0
Total	86	100.0

Educational Background

PMR	2	2.3
SPM	19	22.1
STPM/STAM	4	4.7
SIJIL	0	0
DIPLOMA	22	25.6
IJAZAH	37	43.0
MASTER	2	2.3
PHD	0	0
Total	86	100.0

Marital Status

Single	52	60.5
Married	30	34.9
Divorced	1	1.2
Widowed	3	3.5
Total	86	100.0

Employment Period

0-5 Years	45	52.3
6-10 Years	12	14.0
11-15 Years	12	14.0
16-20 Years	0	0
20+ Years	17	19.8
Total	86	100.0

The table above presents the distribution across all categories. Based on the frequency of male and female respondents, the majority of the participants are male, with 60 respondents (69.8%), while females account for 26 respondents (30.2%). In terms of age categories, the largest group consists of 46 individuals (53.5%) aged between 18 and 25. The second-largest group is those aged between 46 and 55, with 12 respondents (14.0%). There are 11 individuals (12.3%) in the 36–45 age range, and 17 respondents (19.8%) fall within the 26–35 age group. These figures suggest that younger age groups make up a larger portion of the population than older ones. Regarding educational background, the majority of respondents hold a diploma (22 or 25.6%), followed by those with a bachelor's degree (37, or 43.0%). Nineteen individuals (22.1%) have completed the SPM (Malaysian Certificate of Education). The least represented education levels include those with a Master's degree (2 or 2.3%), PMR (2 or 2.3%), and STPM or STAM degrees (4 or 4.7%). The data indicates a strong concentration of individuals with mid- to high- level education, particularly diplomas and bachelor's degrees.

In terms of marital status, the largest group consists of 52 individuals (60.5%) who are single. Married individuals follow, making up 30 respondents (34.9%) of the total. The smallest group is widowed, with 3 people (3.5%), while divorced individuals represent 1 person (3.5%). This data shows that a significant portion of the population is unmarried, including both those who are single and those who are no longer married. Regarding employment duration, the largest group is made up of 12 individuals (14.0%) who have been employed for 6 to 10 years. Next, 45 individuals (52.3%) have been employed for 0 to 5 years. An equal percentage of 12 individuals (14.0%) have worked for 11 to 15 years, and only 17 people (19.8%) have been employed for more than 20 years.

Table 2: Zero Order Correlations between Management Commitment (X1), Safety Training (X2) and Safety Motivation (X3) and Safety Behaviour (Y).

	Variables		Y	X1	X2	X3
Y	Safety Behaviour	Pearson Correlation	1	.885	.989	.962
		Sig. (2 Tailed)		.000	.000	.000
X1	Management Commitment	Pearson Correlation	.885	1	.873	.840
		Sig. (2 Tailed)		.000	.000	.000
X2	Safety Training	Pearson Correlation	.989	.873	1	.973
		Sig. (2 Tailed)	.000	.000		.000
X3	Safety Motivation	Pearson Correlation	.962	.973	.840	1
		Sig. (2 Tailed)	.000	.000	.000	

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

DISCUSSION

The level of Management Commitment is a cornerstone for establishing a robust safety culture and ensuring the consistent implementation of safety practices across an organization. Management's commitment is often expressed through visible leadership involvement, the allocation of adequate financial and human resources for safety measures, and the integration of safety into strategic objectives. Studies have demonstrated that when leaders actively participate in safety activities such as attending safety meetings, conducting walkthroughs, and addressing hazards promptly it sends a strong message about the importance of safety to the workforce (Zahari et al., 2023; Ali et al., 2022). Furthermore, organizations that prioritize safety in their decision-making processes are more likely to experience reduced incident rates and improved safety performance.

The relationship between management commitment, safety training, safety motivation, and safety behaviour forms a comprehensive framework that underpins effective workplace safety management. Management commitment serves as the foundation for fostering a robust safety culture, where safety is prioritized alongside operational efficiency. Studies have consistently shown that when management visibly supports safety initiatives through actions such as allocating sufficient resources, providing clear policies, and addressing safety concerns promptly employees are more likely to internalize safety as a core value (Zahari et al., 2023; Ali et al., 2022). The impact of safety training is evident in bridging the gap between safety awareness and practical application. Training programs that incorporate interactive elements, such as simulations, role-playing, and real-life case studies, significantly improve hazard recognition and response capabilities among employees (Rahman et al., 2024; Singh & Lee, 2023). Safety Motivation acts as a key driver in transforming knowledge into action. Motivation can be categorized into intrinsic factors, such as personal values and a sense of accountability, and extrinsic factors, including incentives, recognition, and positive feedback. Motivated employees are not only more likely to comply with established safety protocols but also to go beyond compliance by proactively identifying risks and suggesting improvements (Kumar et al., 2024; Hassan et al., 2023).

In conclusion, the extent to which management commitment**,** safety training**,** safety motivation**,** and safety behaviour influence workplace safety is substantial and interconnected. Each factor supports and enhances the others, contributing to a comprehensive safety culture that leads to better safety outcomes.

CONCLUSION

The findings emphasize that such elements are crucial in facilitating an injury-free and efficient workplace environment. While the mean score for management commitment is identified as the lowest, it is a basic pillar in the development of a safety culture. With high management commitment to safety, trust is built, and employees can take safety seriously. While it had a lower mean score, management commitment is fundamental to the reinforcement of safety values in an organization and also aids in the implementation of safety programs. It has been found that safety motivation was one of the major variables affecting the safety behaviour of an organization in developing a proactive attitude towards safety among the workers, enabling them to create and maintain effective practice regarding safety. This underlines intrinsic motivation by ensuring that the workers understand and value safety as part of their well-being and performance. The present study also confirms that a potent combination of management commitment, safety training, and sound motivation programs on safety will enable an optimum level of safety behaviour and workplace outcomes.

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