

Impact of Safety Climate on Workers' Safety Practices in the Textile Industry

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ABSTRACT

Background: The textile industry has high risks related to occupational safety and health (OSH), so work accidents often occur. The number of accidents in Indonesia is increasing from year to year. One of the methods to overcome this problem is the implementation of the Occupational Safety and Health Management System. In addition, the safety climate and safety behavior are important indicators in reducing work accidents. This study aims to analyze the influence of the safety climate on safety behavior in the textile industry.

Subjects and Method: This was a cross-sectional study conducted in 2 textile companies located in Surakarta and Semarang, in June-August 2024. A sample of 200 workers was selected using simple random sampling. The dependent variable was safety behavior. The independent variables were safety climate, working period and education level. Data collection was carried out using questionnaires and data was analyzed using path analysis.

Results: Safety behavior was positively influenced by conducive climate (OR= 5.04; 95% CI= 1.68 to 15.13; p= 0.004), implementing occupational health and safety management system (OR= 55.48; 95% CI= 18.26 to 168.53; p < 0.001), high education (OR= 2.18; 95% CI= 0.99 to 4.81; p= 0.052), and long tenure (OR= 2.78; 95% CI= 0.97 to 7.97; p= 0.056).

Conclusion: Safety behavior is positively influenced by conducive climate, implementing occupational health and safety management system, high education, and long tenure.

Keywords: safety climate, safety behavior, textile workers

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BACKGROUND

The textile industry is one of the sectors that has a number of challenges related to occupational safety and health so that work accidents often occur. According to International Labor Organization (ILO) data, about

330,000 workers die each year as a result of work accidents (ILO, 2023). The number of work accidents in Indonesia continues to increase from year to year, so the latest data shows that there were 234,370 cases of work accidents in 2021. Work accidents caused by

unsafe positions amounted to 34.43% and 32.12% of workers did not use safe equipment (Runtuwarow et al., 2020). This shows that unsafe behavior is one of the causes of work accidents.

The implementation of the Occupational Health and Safety Management System (K3) is an important method in reducing workplace accidents. In accordance with Law No. 13 of 2003 concerning Manpower, every company is required to implement SMK3. In addition, safety in the organization can also be assessed through accident indicators, safety behaviors, and safety climate. The safety climate reflects the perception that exists in an organization regarding safety at a certain time and has a crucial role, especially in high-risk industrial sectors such as agriculture, manufacturing (Fagnoli and Lombardi, 2020), transportasi, dan konstruksi (Syed-Yahya et al., 2022; Xia et al., 2023). The safety climate affects not only physical risks but also psychological aspects (Hu et al., 2022).

In addition to the importance of the safety climate, safety behaviors also function to reduce the risk of work accidents and occupational diseases in the work environment. Safety behaviors are divided into two main categories: compliance with safety regulations and participation in safety activities (Mohammadfam et al., 2022). This behavior is carried out consciously by workers and can be monitored through their attitude (Wang et al., 2020). In addition, safety behavior is influenced by the availability and quality of policies, standard operating procedures (SOPs), equipment, materials, and labor training (Bayram et al., 2022), as these factors can trigger unsafe behavior in the workplace.

In Central Java, there are several textile industries that implement K3 in different ways. PT X, located in Surakarta, has not implemented the Occupational Health and Safety Management System (SMK3), while PT Y in Semarang has implemented it. Previous

research has not examined the influence of safety climate on safety behavior in the textile industry using multiple logistic regression analysis in two companies with different SMK3 applications (Wang et al., 2020). A previous study on Emergency Medical Services (EMS) workers used a longitudinal approach and multilevel modeling to assess the impact of the safety climate and emotional fatigue on safety and well-being behaviors (Lee et al., 2024). Therefore, the researcher is interested in analyzing the influence of the safety climate on the safety behavior of workers in the textile industry, taking into account variables related to companies that have and have not implemented OSH.

SUBJECTS AND METHOD

1. Study Design

This was conducted at 2 textile industries from Surakarta and Semarang, Central Java, Indonesia in June - August 2024.

2. Population and Sample

A sample of 200 participants was selected using simple random sampling.

3. Study Variables

The dependent variable was safety behavior. The independent variables were the safety climate, education, and tenure.

4. Operational Definition

Safety behavior: Measures to minimize the occurrence of occupational accidents or occupational diseases in the workplace. Data was collected through questionnaires using a continuous scale and then converted into dichotomy data for data analysis purposes

Safety climate: Safety climate is a value felt in an organization regarding safety at a certain time which is described in 7 dimensions, including 1) management safety priorities, commitment and competence; 2) empowerment of safety management; and 3) management safety fairness; as well as a common perception of 4) worker safety commitments; 5) worker safety priorities and unacceptable

risks; 6) safety communication, learning, and trust in the safety competence of colleagues; and 7) workers' trust in the effectiveness of the safety system. The measurement scale was continuous.

Employment Period: The length of time the respondents worked from the year they started working to the year the research was carried out. The measurement scale was continuous.

Education Level: The last school level completed by the respondents when the research was conducted.

5. Study Instrument

The instruments used to collect data are questionnaires.

6. Data Analysis

Univariate analysis aims to identify the frequency and percentage distribution of each variable studied, such as gender, age, working period, and education level. Bivariate analysis was carried out using simple linear regression. The multivariate analysis was conducted using a multiple logistic regression analysis.

7. Research Ethics

Ethics in research include informed consent, anonymity, and confidentiality, which are

carefully managed during the implementation of research. The research ethics approval letter was issued by the Research Ethics Committee of Dr. Moewardi Hospital Surakarta, on June 11, 2024 with the number 1517/VI/HREC/2024.

RESULTS

1. Univariate Analysis

The results of the descriptive analysis are presented in Table 1. As shown in the table, the number of subjects from companies that have implemented OSH and those that have not was evenly distributed, each accounting for 50%. Regarding work tenure, half of the subjects were new workers, while the other half had longer tenure. Most of the subjects demonstrated safe work behavior (55%) and worked in companies with a favorable safety climate (51%). Continuous variables were converted into categorical data by the researchers, using the median value as the cut-off point. In terms of education, the majority of subjects were junior high school graduates (46%).

Table 1. Sample Characteristics

Variables	Category	Frequency (n)	Percentage (%)
OSH implementation	Good implementation of OSH	100	50%
	Poor implementation of OSH	100	50%
Working Period	Short	100	50%
	Long	100	50%
Safety Behavior	Unsafe	90	45%
	Safe	110	55%
Security Climate	Poor	98	49%
	Good	102	51%
Education	Primary school	35	17%
	Junior high school	91	46%
	Senior high school	74	37%

2. Bivariate Analysis

The results of the bivariate analysis are presented in Table 2. A conducive climate (OR= 10.25; 95% CI: 5.31–19.76; $p < 0.001$), implementation of OSH policies in the

company (OR= 82.25; 95% CI: 30.76–219.88; $p < 0.001$), higher education level (OR= 4.87; 95% CI: 2.92–8.13; $p < 0.001$), and longer tenure (OR= 3.50; 95% CI: 1.94–6.29; $p <$

0.001) were all associated with an increased likelihood of work safety behavior.

Table 2. Simple linier regression of factors related to work safety behavior

Variable	OR	95% CI		p
		Lower Limit	Upper Limit	
Safety climate	10.25	5.31	19.76	< 0.001
Company Type	82.24	30.76	219.88	< 0.001
Education	4.87	2.92	8.13	< 0.001
Working period	3.5	1.94	6.28	< 0.001

3. Multivariate Analysis

The results of the multiple logistic regression analysis are presented in Table 3. A good safety climate (OR = 5.04; 95% CI: 1.68–15.13; $p = 0.004$) and the implementation of OSH policies (OR = 55.48; 95% CI: 18.26–168.53; $p < 0.001$) were significantly associated with a

higher likelihood of safe work behavior. Higher education level (OR= 2.18; 95% CI: 0.99–4.81; $p = 0.052$) and longer tenure (OR= 2.78; 95% CI: 0.97–7.97; $p = 0.056$) also showed a positive association, although these results were not statistically significant.

Table 3. Results of Multiple Logistic Regression Analysis of Factors Associated with Work Safety Behavior

Independent Variables	OR	95% CI		p
		Lower Limit	Upper Limit	
Good safety Climate	5.04	1.68	15.13	0.004
Type of company	55.48	18.26	168.53	< 0.001
Education level	2.18	0.99	4.80	0.052
Tenure	2.78	0.97	7.96	0.056

DISCUSSION

The results showed a significant relationship between safety climate and safety behavior. Companies with a strong safety climate were 5.04 times more likely to demonstrate safe behaviors than those with a poor safety climate. This relationship is a central theme in occupational safety research. Safety climate reflects employees' shared perception of workplace safety values, while safety behavior refers to the actions taken to maintain safety. Understanding this link can help companies enhance safety performance and reduce accident risks.

These findings are consistent with previous research showing that enhancing the safety climate and providing safety training positively influence workers' safe behavior at construction sites in Taiwan, thereby reducing

safety-related incidents (Chen et al., 2021). Similarly, a study conducted in Indonesia found that improving the safety climate within companies significantly strengthens safety behavior, which in turn helps lower the number of workplace accidents (Hertanto et al., 2023).

In addition, the type of company also influenced safety behavior. Companies that implemented a Safety Management System were 55.48 times more likely to demonstrate safe behavior compared to those that did not, and this relationship was statistically significant. These results align with previous studies showing that the adoption of a Safety Management System significantly improves both safety and task performance, with a stronger effect on task performance (Ajmal et al., 2021; Nkrumah et al., 2021). However, the

successful implementation of a Safety Management System requires integration with a broader management system. An integrated management system enhances employee participation in risk management activities, thereby helping to reduce workplace accidents. Furthermore, employees' knowledge and attitudes toward the Safety Management System play a crucial role in its effectiveness. Thus, combining an integrated management system with strong employee understanding of the Safety Management System can simultaneously reinforce occupational safety efforts and reduce work-related incidents (Ahmad et al., 2022; Ramos et al., 2020).

Furthermore, this study shows that education level also affects safety behavior. Individuals with higher education levels were 2.18 times more likely to demonstrate safe behavior compared to those with lower education levels, and this association was close to statistical significance. These findings are consistent with previous research indicating that higher education among construction workers positively contributes to safety performance or safety behavior, a relationship further strengthened by individual learning ability and the presence of a strong, resilient safety culture (Chan et al., 2023). Other studies have also highlighted that various personal and environmental factors influence safety performance, including an individual's capacity to learn. To improve construction workers' safety performance, it is recommended to emphasize learning from incidents, effective information sharing and utilization, and reinforcing management's commitment to safety (Chan et al., 2023).

Tenure was also found to influence safety behavior. Employees with longer work experience were 2.78 times more likely to engage in safe behavior compared to newer employees, and this association was marginally significant. These findings are consistent with previous research indicating that longer

average tenure within an organization is associated with a stronger safety climate. Notably, this relationship is curvilinear, meaning that at higher levels of tenure, even small increments in service length contribute more substantially to strengthening the safety climate than at lower levels. This suggests that the longer an employee remains in the organization, the greater the positive impact on the safety climate, particularly in the later stages of their career (Beus et al., 2010; Hong et al., 2023).

AUTHOR CONTRIBUTION

All authors have contributed significantly to the analysis of the data as well as the preparation of the final manuscript.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

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