



Safety Climate and Construction Workers' Compliance on the Use of Personal Protective Equipment in Construction Project Jakarta

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Background: One of the major factors that causing injuries on construction site workers is lack of workers' compliance on Basic Construction Safety Rules, particularly in the regulatory compliance with the use of Personal Protective Equipment (PPE). An individual perception of workplace safety management, which includes policy, procedure and practice that can potentially influence the individual safety behavior at the workplace is called safety climate. This study aimed to examine the relationship between safety climate and construction workers' and the use of personal protective equipment (PPE). *Method:* Participants of this research were 185 construction workers at Taman Sari Hive Office Park, Jakarta. Data were obtained using purposive sampling technique. We used Safety Climate Scale and Compliance with the Use of PPE Scale to collect the data. *Results:* Simple regression analysis showed that safety climate was positively associated with compliance with the use of PPE ($r = .63; p < .001$). *Conclusion:* Positive safety climate is likely to lead to higher compliance with the use of PPE. Safety climate accounted for 40% of the variance in compliance with the use of PPE. Suggestion for future research was the use of different antecedent variables to predict compliance with the use of PPE.

Keywords: Construction Workers, Safety Climate, Compliance, Personal Protective Equipment.

1. INTRODUCTION

Nowadays, a lot of news about accidents in workplaces are evident in Indonesia. Based on research by the International Labor Organization (ILO), Indonesia is a country with the second highest rate of occupational accidents.¹ The number of accidents in Indonesia since 2007 has been constantly increasing. Data from Social Security showed that in 2007 there were 83,714 cases of occupational accidents that occurred in Indonesia, 94,736 cases in 2008, 96,314 cases in 2009, 98,711 cases in 2010 and 99,491 cases of occupational accidents that occurred in 2011.²

In Indonesia, the accident in the construction sector is the largest contributor (i.e., 32%) compared to other sectors such as the transportation sector (9%), forestry sector (4%) and mining sector by (2%).³

Accidents in the sector of construction projects is quite high, because the construction workers' are less understood and less discipline or obedience to the provisions of the Occupational Health and Safety (K3), especially in the use of Personal Protective Equipment (PPE). Workplace accidents also occur at construction projects. Based on the secondary data, it can be seen that there were 15 accidents and 9 violations uses of PPE during October 2014–October 2015. Among the 15 accidents, five of

them were due to neglecting the use of PPE, and disobedience to the regulations on the use of PPE which can lead to injuries or minor injuries.

Compliance as a condition created and formed through a process of a series of behavior that indicate the values of obedience, loyalty, regularity and order.⁴ PPE is a set of safety equipment used by workers to protect all or part of their body from possible exposure to the potential hazards of the work environment against accidents and occupational illness. The above definition can be concluded that compliance with the use of PPE is a condition that is created from a series of behavior that indicate the value of obedience, regularity and order to meet the superiors demand to use a set of tools for safety protection to all workers for a common goal and a common security to be shielded from the potential hazards of the work environment.⁵ The compliance of safety behavior (compliance with the use of PPE) and behavioral safety participation can affect positively and significantly to the safety climate. Both of these behaviors are considered to protect workers and reduce injuries in the workplace.⁶ Safety climate is a perception of workers in management's attitude towards safety and perceptions to the extent of the contribution of safety workplace in the production process in general.⁷

Some research shows that the higher the safety climate, the higher the adherence to obey the rules particularly in the use

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of PPE. For example, a research study which involved staff and construction workers at PT. Adhi Karya (Persero) Tbk demonstrated that safety climate and personal experience significantly influencing the compliance of construction workers safety regulations, especially in the use of PPE when working.⁸ Other research also showed that there was a positive relationship between safety climate with regulatory compliance with the use of PPE in the construction workers of PT. PP (Persero) Tbk.⁹

Based on the explanations that have been presented, it can be seen that safety climate played an important role in the adherence of Personal Protective Equipment (PPE) use in construction workers.

The hypothesis of this study was “there is a positive and significant relationship between safety climate and compliance with the use of PPE in construction workers.”

2. METHOD

This study had two variables, i.e., Compliance with the Use of Personal Protective Equipment (PPE) as a dependent variable, and safety climate as an independent variable. Subjects in this study were 185 construction workers on the Project of Taman Sari Hive Office Park Jakarta. Participants of this study were 123 workers and the number of tryout sample was 62 workers. The data were obtained by non probability sampling with purposive sampling techniques.

Data collection instruments were Safety Climate Scale (25 valid items; $\alpha = .88$) and Compliance Use of Personal Protective Equipment (PPE) Scale. (24 valid items; $\alpha = .88$). The data were analyzed using a simple regression analysis.

Data were obtained using purposive sampling technique. Normality test based on variable values obtained compliance with the use of PPE the Kolmogorov-Smirnov $p.70$ ($p > .05$) with a significance of $p.72$ ($p > .05$). While normality test results of the safety climate variable values obtained by Kolmogorov-Smirnov was significance $p = .98$ with a significance of $p = .30$ ($p > .05$). It showed that the data were normally distributed.

Test of the linearity of the relationship between safety climate and compliance with the use of PPE, the coefficient was $F = 79.08$ with a significance value of $p = .000$. These results showed that the relationship between the two variables was linear.

3. RESULTS

Hypothesis test results using simple regression analysis showed the correlation coefficients between safety climate and compliance with the use of PPE was $.63$ ($p < .001$). The correlation coefficient is a positive value indicates the direction of the relationship between the two variables is positive, which means the positive safety climate, the higher the level of compliance with the use of PPE, and vice versa, if the climate was negative, the lower the safety compliance with the use of PPE among project workers. The significance level of correlation was $p < .001$, indicates that there was a significant relationship between the safety climate and compliance with the use of PPE. Regression analysis showed that the hypothesis of the researcher was accepted.

The coefficient of determination (R square) of $.40$ means that safety climate contributed effectively to the adherence by 40% by the use of PPE, while the remaining 60% is determined by other factors that were not investigated in this study. The research

proved that the hypothesis was accepted. There was a significant positive relationship between safety climate concepts to the compliance of PPE use.

The results of a simple regression analysis were obtained based on the hypothesis test showed that there was a positive and significant correlation between the safety climate and compliance with the use of PPE. The correlation coefficient was $.63$ ($p < .001$). Direction of the relationship between the two variables is positive, which means the positive safety climate, the higher the compliance of PPE use. Conversely, the negative safety climate, the lower the compliance of PPE use.

Descriptive analysis about the categorization of the safety climate can be seen that 43.90% of workers felt that the safety climate was very positive, 45.53% of workers felt that the safety climate was positive, 10.57% of workers felt a moderate climate, and the absence of workers who felt the safety climate was very negative and negative. Overall project workers safety climate had a positive safety climate average, means that the subject can see and understand how safety management at the project site-related policies, procedures and safety practices can influence the behavior of workers.

The analysis result of the compliance with the use of PPE variable showed that the workers had a high level of compliance of PPE use. As many as 30.89% of workers had a very high level of compliance with PPE use, as many as 55.28% of workers had a high level of compliance with PPE use, as many as 13.83% of workers had a moderate level of compliance with PPE use, and no workers were in the category of very low and low. It can be concluded that the highest compliance of the use of PPE was in the high category which was as much as 55.28%.

4. DISCUSSION

Compliance of the use of PPE was high on workers as well as the safety climate which were in positive category, means the regulations imposed on the project quite well in improving environmental compliance of the use of PPE in construction projects.

Research made to employees in Ankara, Turkey, showed that there was a positive relationship between safety climate with safety behavior.¹⁰ According to research at 345 workers consist of workers in mechanical industry, textile workers and workers of food processing in Italy, showed that safety climate can affect the balance of attitudes and behavior of safety.¹¹ While other research, conducted to the construction workers, showed that the safety behavior can be influenced by the commitment of safety management, social support, production pressures and individual factors including safety knowledge and motivation of safety.¹²

Ojanen et al. argues that on the results of the Safety Climate research can obtained information about management's goal and strategies on safety. Measuring safety climate of an organization can provide information on the safety of the organization itself. If the safety climate of a workplace is relatively positive, then the information about the management's goal and strategies on safety conveyed properly to the members or workers who were in the company.¹³ Companies should strive to measure the safety climate in order to identify and fix the organization and management issues related to safety before the accident happen.¹⁴

According to interviews with supervisor conducted at research sites, the Occupational Health and Safety (K3) management in the workplace was unable to supply PPE to all of the workers.

Meanwhile, the result of interviews with Safety, Healthy, Environment (SHE), the supervisor was also underestimating the use of PPE that has been provided by the company, so other workers were reluctant to use PPE. It implies that the safety climate in construction projects of Taman Sari Hive Office Park Jakarta in the aspect of safety management practices and safety practices can affect the compliance with the use of PPE while working.

5. CONCLUSIONS

Based on the analysis results, it can be concluded that there was a positive and significant relationship between safety climate with the compliance of PPE use. The more construction workers perceived positive about safety climate, the higher the compliance of PPE use in the work place. The advantage of this study from previous studies was researcher used a more specific sample characteristic.

We recommended that the construction workers are expected to be able to maintain a positive perception with regard to the management of safety in the workplace and has the will to use PPE when working and when at the construction site.

In addition, the company or the project site is expected to maintain a positive safety climate in the workplace, so workers can improve the compliance of the use of PPE for the sake of common security at work and have a sense of obedience, regularity and order on safety regulations.

Recommendation for future research is to develop other variables related to compliance with the use of PPE in order to be a comparison for future research studies. The second

recommendation for future research is making a scale research with more specific indicators and item, also using probability sampling.

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