

ANALYSIS OF FACTORS INFLUENCING COMPLIANCE WITH THE USE OF PERSONAL PROTECTIVE EQUIPMENT BY PT JMKT FIELD WORKERS

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Abstract

Compliance in the use of Personal Protective Equipment (PPE) is an important element in the implementation of the Occupational Safety and Health (K3) system. "However, in reality, the level of worker compliance in the field is still relatively low, especially in the area of toll road management and maintenance. This study aims to identify and analyze the factors that influence the compliance of PT Jasamarga Kualanamou Tol field workers in the use of PPE during work. The study used a quantitative approach with a cross-sectional analytical observational design. A total of 30 field workers were selected as respondents using a total sampling technique. Data were collected through questionnaires, direct observation, and interviews, then analyzed using the Chi-Square test with a significance level of $p < 0.05$. The results showed a significant relationship between the level of knowledge ($p = 0.025$) and attitude ($p = 0.035$) with compliance in the use of PPE. In contrast, the variables of PPE availability ($p = 0.098$) and supervision ($p = 0.113$) did not have a significant relationship with the level of worker compliance. Worker knowledge and attitudes play an important role in encouraging compliance in the use of PPE, while the availability and supervision factors have not been proven to have a significant influence. Therefore, efforts are needed to increase ongoing socialization and training of K3, strengthen safety culture in the work environment, and implementation of more effective monitoring mechanisms to foster safe work behavior among field workers.

Keywords: Personal Protective Equipment, Compliance, Supervision, Knowledge, Attitude

Introduction

Occupational Safety and Health (OSH) is crucial for protecting employees from the dangers of work-related accidents and illnesses. The World Health Organization (WHO) defines occupational health as an initiative aimed at maintaining and improving the physical, mental, and social well-being of employees in various sectors, while reducing health problems related to the work environment and processes (Wahyudi et al., 2025). Therefore, occupational safety and health (OSH) plays a crucial role in contemporary organizational management and should not be considered merely an administrative task.

Field work, particularly in toll road administration and maintenance operations, is considered to have a relatively high risk of occupational accidents. Employees in this sector face direct exposure to various potential risks, including sunlight, dust, noise, heavy traffic, and the operation of motorized

equipment such as lawn mowers. These conditions require workers to consistently use Personal Protective Equipment (PPE) as the definitive protection in implementing occupational safety. The use of personal protective equipment (PPE) mitigates the risk of injury from physical and chemical exposures in the workplace. Observations indicate that compliance with PPE use among workers remains very low, particularly in fieldwork sectors such as toll road maintenance (Wahyuni et al., 2025).

Inadequate worker compliance suggests that the presence of safety facilities and formal policies has failed to influence behavioral change. Contributing variables generally include inadequate knowledge, negative attitudes toward PPE, discomfort during use, and inadequate supervision in the workplace (Febriyanti & Widajati, 2025). Previous research has shown that attitudes and supervision substantially influence the level of compliance of food industry personnel in using Personal Protective Equipment (PPE) (Devila et al., 2022). Similar results were also found by (Malwi et al., 2024), who found that knowledge, attitudes, motivation, and supervision influence compliance, although PPE comfort does not have a direct effect.

Although various studies have examined factors influencing compliance with PPE use, most have focused on the manufacturing and construction sectors, which have different working conditions. Research on worker compliance in the toll road management sector is still limited, even though this work environment poses unique risks due to direct interaction with fast-moving vehicles and activities in open areas. Therefore, this study offers a novel approach by examining compliance with PPE use in the context of field work on toll roads, which has unique characteristics compared to other industrial sectors.

This study uses a holistic methodology by evaluating internal elements (knowledge and attitudes) and external aspects (availability and supervision) related to PPE compliance. These results are expected to provide a comprehensive understanding of field worker safety behavior and provide a foundation for companies to continuously improve advice, supervision, and occupational safety and health culture.

Therefore, this study aims to analyze the factors influencing PPE compliance among PT Jasamarga Kualanamu Tol field workers by examining the relationship between knowledge, attitudes, availability, and supervision and compliance levels. The results are expected to provide scientific contributions and practical recommendations for companies in strengthening OHS management and building a safe and safety-oriented work culture.

Method

This study used a quantitative approach with a cross-sectional analytical observational design to evaluate the determinants influencing compliance with the use of personal protective equipment (PPE) among field workers at PT Jasamarga Kualanamu Tol (JMKT). The population consisted of 30 toll road maintenance personnel, all of whom were sampled using a complete sampling technique. Data were collected through a closed-ended questionnaire addressing variables such as knowledge, attitude, availability, supervision, and compliance level, supplemented by observations and interviews. Analysis was performed using SPSS version 26.0, using univariate and bivariate analysis with the Chi-Square test at a significance threshold of $p < 0.05$.

Results

Table 1. Frequency Distribution of Respondent Characteristics

No	Characteristics	<i>f</i>	%
Gender			
1.	Man	30	100.0
2.	Woman	-	0
Total		30	100.0
Age			
1.	25-39	10	33.3
2.	40-54	16	53.3
3.	55-60	4	13.3
Total		30	100.0
Years of service			
1.	New (3-36 Months)	19	63.3
2.	Intermediate (37-72 months)	7	23.3
3.	Long (73-96 Months)	4	13.3
Total		30	100.0

Based on Table 1, of the 30 respondents studied, all were male (100%), indicating that the work at the research location is entirely dominated by male workers who are active in high-risk fields.

In terms of age, the majority were between 40-54 years old (53.3%), followed by 25-39 years old (33.3%) and 55-60 years old (13.3%). This condition indicates that the majority of workers are of productive age with sufficient experience, but still require supervision to maintain safety discipline.

Based on length of service, the majority of respondents were classified as new with 3-36 months of experience (63.3%), while 23.3% had medium length of service (37-72 months) and 13.3% had long service (73-96 months). This indicates that the majority of workers are still adapting to the system and implementation of PPE use.

Table 2. Cross Tabulation between Knowledge and Compliance with PPE Use

Knowledge	Compliance with the Use of PPE				Total		<i>Sig-p</i>
	Obedient		Not obey		<i>f</i>	%	
	<i>f</i>	%	<i>f</i>	%			
Good	12	40	12	40	24	80	0.025
Not good	0	0	6	20	6	20	
Total	12	40	18	60	30	100	

Based on table 2, of the 24 respondents with good knowledge (80%), 12 people (40%) complied and 12 people (40%) did not comply with using PPE. All six respondents with low knowledge (20%) did not comply. The Chi-Square test shows $p = 0.025 (< 0.05)$, indicating that knowledge has a significant effect on compliance with the use of PPE.

Table 3. Cross Tabulation between Attitude and Compliance with PPE Use

Attitude	Compliance with the Use of PPE				Total		<i>Sig-p</i>
	Obedient		Not obey		<i>f</i>	%	
	<i>f</i>	%	<i>F</i>	%			
Good	4	13.3	13	43.3	17	56.7	0.035
Not good	8	26.7	5	16.7	13	43.3	
Total	12	40	18	60	30	100	

Based on Table 3, of the 17 respondents (56.7%) who had a good attitude, only 4 people (13.3%) were compliant and 13 people (43.3%) were not compliant in using PPE. Meanwhile, of the 13 respondents (43.3%) with a less good attitude, 8 people (26.7%) were compliant and 5 people

(16.7%) were not compliant. The Chi-Square test showed $p = 0.035 (<0.05)$, indicating that attitude has a significant effect on compliance in using PPE.

Table 4. Cross Tabulation between Availability and Compliance with Use of PPE

Availability	Compliance with the Use of PPE				Total		Sig-p
	Obedient		Not obey		f	%	
	f	%	f	%			
Good	9	30.0	8	26.7	17	56.7	0.098
Not good	3	10.0	10	33.3	13	43.3	
Total	12	40	18	60	30	100	

Based on Table 4, of the 17 respondents (56.7%) who assessed the availability of PPE as good, 9 people (30%) were compliant and 8 people (26.7%) were not compliant. Meanwhile, of the 13 respondents (43.3%) who assessed the availability as poor, 3 people (10%) were compliant and 10 people (33.3%) were not compliant. The Chi-Square test results showed $p = 0.098 (> 0.05)$, indicating there is no significant relationship between the availability of PPE and worker compliance.

Table 5. Cross Tabulation between Supervision and Compliance with the Use of PPE

Supervision	Compliance with the Use of PPE				Total		Sig-p
	Obedient		Not obey		f	%	
	f	%	f	%			
Good	11	36.7	12	40.0	23	76.7	0.113
Not good	1	3.3	6	20.0	7	23.3	
Total	12	40	18	60	30	100	

Based on Table 5, of the 23 respondents (76.7%) who rated supervision as satisfactory, 11 respondents (36.7%) complied with the use of PPE, while 12 respondents (40%) did not. Among the 7 respondents (23.3%) who rated monitoring as inadequate, 1 respondent (3.3%) complied, while 6 respondents (20%) did not. The Chi-Square test showed $p = 0.113 (> 0.05)$, thus indicating no significant correlation between monitoring and compliance. Descriptively, increased monitoring appears to increase worker compliance.

Discussion

Knowledge is the result of human thought processes acquired through experience, observation, and interaction with the surrounding environment. Knowledge serves as a foundation for humans to understand reality, assess right and wrong, and hone logical thinking skills. Therefore, knowledge is a crucial element in human life because it forms the basis for the formation of science and the advancement of civilization (Octaviana & Ramadhani, 2021). In the context of personal protective equipment (PPE) use, knowledge plays a vital role. Workers who understand the purpose, benefits, and risks arising from the use or neglect of PPE generally exhibit a more positive attitude toward workplace safety.

The study showed a strong correlation between knowledge and compliance with PPE use ($p = 0.025$). Employees with superior understanding are often more diligent in using PPE than individuals with less expertise. This finding aligns with research conducted by (Adilla & Srisantyorini, 2025), which identified knowledge as a key determinant of PPE compliance in the construction industry. (Noviarmi & Prananya, 2023) emphasized that knowledge and attitude contribute to increased compliance, while other factors also influence worker behavior.

However, several studies have shown that high levels of knowledge do not always lead to workers complying with PPE use, due to factors such as discomfort, the work environment, and lack of supervision (Febryanti & Widajati, 2025). Therefore, increased compliance needs to be balanced with improvements in supporting aspects, including improving PPE comfort, effective field supervision, and strengthening a safety culture in the workplace.

According to Thurstone and Likert (Fishman et al., 2021), attitude is a person's tendency to evaluate something positively or negatively. A positive attitude toward occupational safety encourages compliance with PPE use, while a negative attitude, such as feeling PPE is uncomfortable or cumbersome, can reduce it.

The results of the study showed a significant relationship between attitude and compliance with PPE use ($p = 0.035$). This means that the more positive workers' views on the importance of PPE, the higher their compliance rate, as they believe PPE is essential for preventing injuries and protecting themselves from occupational hazards.

These results align with research (Adilla & Srisantyorini, 2025), which shows that attitude is a crucial determinant of construction workers' compliance with PPE use. Employees with positive attitudes are twice as likely to comply as those with negative attitudes. Similar results were also found by (Ilmiati et al., 2024) among palm oil plantation workers, indicating that a positive attitude toward safety significantly influences compliance with PPE use.

Worker attitudes can be shaped by various factors, such as work experience, examples set by superiors, and the prevailing safety culture in the workplace. Research (Fiantika et al., 2025) indicates that a positive attitude toward safety can be developed through the instilling of safe work behaviors and consistent supervision by management. Thus, attitude formation does not solely depend on individual knowledge but is also influenced by the social environment and organizational policies that support the implementation of occupational safety and health (OHS).

Furthermore, positive employee attitudes can be strengthened through regular outreach activities, interactive OHS training, and effective risk communication. Support from supervisors and appreciation for workers who consistently and diligently use PPE also play a crucial role in increasing intrinsic motivation to maintain safe work behaviors. Therefore, efforts to increase compliance with PPE use are not limited to simply increasing knowledge but also need to be directed at developing and sustaining positive attitudes within the work culture, particularly in the toll road management sector.

The availability of personal protective equipment (PPE) plays a crucial role in shaping employee safety behavior. According to Indonesian Minister of Manpower Regulation No. 8 of 2010, companies are required to provide PPE appropriate to potential hazards, ensure its suitability and standard of use, and replace damaged or unsuitable PPE.

The results showed no significant relationship between PPE availability and employee compliance ($p = 0.098$). However, descriptively, employees who perceived PPE as being well-stocked tended to be more compliant. This indicates that availability alone is not sufficient, as factors such as comfort, quality, and appropriate fit also influence compliance with PPE use.

Research (Maslina et al., 2021) shows that the completeness and suitability of PPE influence worker compliance with its use at the Balikpapan Water Company (PDAM). However, without adequate support and supervision, improving compliance is difficult. Similarly, (Ilmiati et al., 2024) noted that workers are often reluctant to use PPE if they feel uncomfortable or if the PPE is not the right size, even if it is readily available.

According to (Febryanti & Widajati, 2025), the suitability and comfort of PPE for the type of work are important factors influencing worker compliance. Although the statistical relationship is not always significant, companies still need to ensure that the PPE provided is appropriate, comfortable, and appropriate to work needs. Routine supervision, a rapid replacement mechanism, and worker involvement in PPE selection can also increase responsibility and compliance with its use.

This study found that supervision had no significant effect on compliance with PPE use ($p = 0.113$). Although not statistically significant, descriptive results indicate that workers with good supervision had higher compliance rates than workers with less supervision. These results indicate that supervision remains an important factor supporting safe behavior, although its effect can be influenced by other factors such as knowledge, attitudes, and the availability of PPE.

Research (Fiantika et al., 2025) states that supervision is an external factor that contributes significantly to improving safe work behavior. Consistent and firm supervision has been shown to effectively increase worker compliance with personal protective equipment (PPE). According to (Maslina et al., 2021), direct supervision in the field can double the level of worker compliance compared to work areas with minimal supervision.

Research (Agustina et al., 2025) found that supervision was significantly associated with compliance with PPE use ($p = 0.034$). Consistent supervision, both through routine inspections and direct monitoring in the field, has been shown to increase worker compliance with PPE use.

In the context of field workers in the toll road sector, the effectiveness of supervision is often influenced by unique work characteristics, such as large work areas, dynamic or mobile locations, and a relatively large number of workers. These conditions can result in less than optimal supervision at every work point. Therefore, a more structured supervision strategy is needed, for example, by establishing a field supervisory team that works according to a schedule, implementing a safety checklist, and implementing a reward and sanction system to foster a culture of discipline. Active, consistent, and targeted supervision can improve and maintain worker compliance with the use of PPE in the toll road work environment.

Conclusion

The results of this study indicate that knowledge and attitude significantly influence compliance with PPE use among PT Jasamarga Kualanamu Tol field workers, while PPE availability and supervision have no statistically significant effect. These results confirm that knowledge and attitude are the main factors in shaping compliant behavior regarding PPE use. Considering that the company has implemented a good occupational safety system and provided supporting facilities, efforts to improve compliance should be focused on the field implementing vendors. Vendors are expected to strengthen K3 guidance and socialization, increase direct supervision in the work area, and ensure the comfort and suitability of PPE for workers. With these steps, the implementation of a safe and disciplined work culture in the toll road project environment can develop consistently and sustainably.

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