

The Relationship between Supervision and Attitude to Compliance with the Use of Personal Protective Equipment for Industrial Workers.

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Article Information

Accepted 17-03-2025

Approved 13-05-2025

Published 30-06-2025

Keywords

Satisfaction, Service,
Laboratory

e-ISSN

2613-9219

National Accreditation

SINTA 4

Keywords

Satisfaction, Service,
Laboratory

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Abstract

Background: Occupational safety and health (OHM) is a critical aspect of the work environment, especially in high-risk industrial sectors. The proper and standard use of Personal Protective Equipment (PPE) is an important effort to reduce the risk of work accidents. This study aims to analyze the relationship between knowledge and attitudes towards compliance with the use of PPE for industrial workers. **Methods:** This quantitative research with a cross-sectional approach was applied to employees of the Production department. Samples were taken by the Total Sampling Technique where samples were taken by all production workers.. The research instrument is in the form of a questionnaire that measures knowledge, attitudes, and compliance with the use of PPE. **Results:** The characteristics of the respondents were dominated by males (72.5%), with the majority having a high school education (62.5%) and over 30 years old (62.5%). As many as 58% have less than 5 years of work experience. The level of knowledge of respondents about PPE was relatively low (52.5% knowledge lacked), although attitudes towards PPE tended to be positive (58.75% good attitudes). However, compliance with PPE use is still low (22.5% compliant). The analysis showed a weak relationship between knowledge and compliance ($r: 0.267$; $p=0.013$), while the relationship between attitude and compliance was stronger ($r: 0.624$; $p=0.000$), indicating that attitude played a more significant role in improving compliance with PPE use. **Conclusion:** the level of knowledge of respondents about the use of PPE is still low, although their attitudes tend to be positive and compliance with PPE use is also low, by showing a stronger relationship of attitudes towards compliance than knowledge, **Suggestion:** It is necessary to increase knowledge and form positive attitudes through continuous training in improving compliance with PPE use.

Abstract

Background: Occupational safety and health (OSH) is a critical aspect of the work environment, especially in the high-risk industrial sector. The use of Personal Protective Equipment (PPE) appropriately and according to standards is an important effort to reduce the risk of work accidents. This study aims to analyse the relationship between knowledge and attitude towards compliance with the use of PPE of industrial workers. **Methods:** This quantitative study with a cross-sectional approach was applied to employees of the Production section. Samples were taken by the Total Sampling Technique where the samples taken were all production workers. The research instrument was a questionnaire that measured knowledge, attitudes, and compliance with the use of PPE. **Results:** The characteristics of respondents were dominated by men (72.5%), with the majority having a high school education (62.5%) and being over 30 years old (62.5%). A total of 58% had less than 5 years of work experience. Respondents' level of knowledge about PPE was low (52.5% lack of knowledge), although attitudes towards PPE tended to be positive (58.75% good attitude). However, compliance with PPE use was low (22.5% compliant). Analysis showed a weak relationship between knowledge and compliance ($r: 0.267$; $p=0.013$), while the relationship between attitude and compliance was stronger ($r: 0.624$; $p=0.000$), indicating that attitude plays a more significant role in improving compliance with PPE use. **Conclusion:** the level of knowledge of respondents about the use of PPE is still low, although their attitudes tend to be positive and compliance with the use of PPE is also low, showing a stronger relationship between attitude and compliance than knowledge, **Suggestion:** It is necessary to increase knowledge and build positive attitudes through continuous training to improve compliance with PPE use.

INTRODUCTION

Occupational safety and health (OHM) is an important aspect of the world of work, especially in high-risk sectors, such as construction, manufacturing, and mining. One of the efforts to reduce the risk of work accidents is the use of Personal Protective Equipment (PPE) appropriately and according to standards [1]. The use of PPE is a preventive effort to protect workers from physical, chemical, biological, and ergonomic hazards in the work environment [2]. According to the Regulation of the Minister of Manpower and Transmigration of the Republic of Indonesia No. 8/MEN/VII/2010 article 1 (1), PPE is defined as a tool that has the ability to protect a person by isolating part or all of the body from potential hazards in the workplace [3].

The work environment, especially in the industrial sector, often presents a variety of risks that can lead to injury, work-related illnesses, or even death. Work accidents do not only occur during the work process, but can also occur on the way to or from work [4]. Every year there are more than 250 million work accidents and more than 160 million workers suffer from occupational hazard diseases, with 1.2 million deaths indicating the high human and social costs of production, while in Indonesia, work accident cases continue to increase, recorded 123,000 cases in 2017 (up 20% from 2016), and BPJS Employment data shows an increase from 101,368 cases in 2016 to

173,415 cases in 2018, as well as 10,923 cases until September 2019, so serious policies and actions are needed to reduce the number of work accidents. [5].

Work accidents are generally caused by three main factors, namely *unsafe action* (88%), *unsafe condition* (10%), and factors beyond human control (2%) [6]. *Unsafe actions* are often influenced by internal factors such as lack of knowledge, insecure attitudes, decreased concentration, fatigue, and boredom [7]. In addition, external factors such as an inadequate work environment also contribute to the occurrence of accidents [8]. Human behavior, including age characteristics, gender, education level, work experience, and psychological condition, are the dominant factors that affect safety

work [9]. A work environment that does not meet standards safety also increases the risk of incidents accident [10].

Based on data on the findings of the K3 field at PT X Company, in 2024 there will be 175 findings related to unsafe actions, with 65% of them caused by violations in the use of PPE. This shows that compliance in the use of PPE is still very low among workers. This low compliance can be influenced by various factors, including a lack of knowledge about the importance of PPE and the attitude of workers who do not support the implementation of K3 [11]. Therefore, this study aims to analyze the relationship between knowledge and attitudes towards the compliance of the use of PPE at PT X. In addition, this study also wants to identify the obstacles faced by workers in complying with the PPE use protocol, so that

can provide recommendations to improve the K3 culture in the company.

METHOD

This study uses a quantitative method with an observational analytical design and a cross-sectional approach, carried out at PT. X, is a Manufacturing Company in the field of Textile and Clothing. in the period from February 1 to March 1, 2025, with the population of employees in the Production section. 80 workers, using the Total Sampling Technique where samples were taken by all production workers. *The independent variable* includes knowledge and attitude, while the dependent variable is compliance with the use of PPE. *The research instrument* is in the form of a questionnaire that measures knowledge, attitudes, and compliance with the use of PPE. Data collection by observing worker behavior and conducting interviews and filling out questionnaires, Data analysis using the Chi-Square Test Add here how to collect data, how to analyze data, and the number of the Ethical Clearance Certificate of Research Protocol.

RESULT

Table 1. Respondent Characteristics

V a r i a b e l	n	%
Gender		
- Man	58	72.5
- Woman	22	27.5
Education		
- SD	3	3.75
- SMP	18	22.5
- SMA	50	62.5
- D3/S1/S2	9	11.25
Age		
- < the Parties shall ensure that the	30	37.5
- ≥30	50	62.5
Length of Work		
- < 5	47	58.75
- ≥5	33	41.25

Based on Table 1, the characteristics of the respondents in this study show that the majority of respondents are male, namely 58 people (72.5%), while female respondents amounted to 22 people (27.5%), in terms of education level, as many as 3.75% of respondents were educated in elementary school, 22.5% were educated in junior high school, while the majority of workers had a high school education level of 62.5% and D3/S1/S2 as much as 11.25%. The age distribution of respondents showed that 37.5% were less than 30 years old, while 62.5% were over 30 years old. Based on the length of work, as many as 58% of respondents have less than 5 years of work experience, while another 41.25% have more than 5 years of work experience.

Table 2. Knowledge Questionnaire

Aspects	Respondent's Answer			
	True		Wrong	
	n	%	n	%
Understanding APD	44	55	36	45
Types APD	32	40	48	60
Functions and Purpose	20	25	60	75

Based on Table 2, as many as 55% of respondents understand the meaning of PPE correctly, but 45% are still wrong, indicating that although the majority have a basic understanding, there is a significant proportion who do not understand the definition. Only 40% were able to correctly identify the types of PPE, while 60% were wrong, indicating a low level of knowledge about the different types of PPE that required more attention in training. In addition, only 25% of respondents understood the function and purpose of PPE use, and 75% answered falsely, which is very worrying and shows an urgent need to increase understanding of the importance of PPE in protecting occupational health and safety.

Table 3. Attitude Questionnaire

Aspects	Respondent's Answer					
	TS		S		SS	
	n	%	n	%	n	%
Awareness Safety	12	15	38	47.5	30	37.5
Compliance Policy	6	7.5	24	30	50	62.5
Influence Lingkungan	4	5	40	50	36	45

Based on the table. 3 The results of the questionnaire showed a positive attitude towards Personal Protective Equipment (PPE) among respondents. As many as 85% of respondents showed good safety awareness, although 15% still lacked the importance of safety. In addition, 62.5% of respondents strongly agreed that they are compliant with the PPE use policy, indicating a good acceptance of the existing rules. Finally, 95% of respondents felt a positive environmental influence on their attitude towards PPE. Nonetheless, there is still room to increase understanding of the importance of PPE, especially among respondents who are less safety-conscious.

Based on Table 4. The questionnaire on the compliance of Personal Protective Equipment (PPE) use showed that the majority of respondents felt that the availability and accessibility of PPE in the workplace was good, with 90% of respondents agreeing or strongly agreeing. In addition, 88.75% of respondents also considered that supervision and policy enforcement related to the use of PPE were quite effective. This indicates that the work environment has adequate mechanisms to

support compliance with the use of PPE, which is important for maintaining occupational safety.

Table 4. PPE Wearer Compliance Questionnaire

Aspects	Respondent's Answer					
	TS		S		SS	
	n	%	n	%	n	%
Availability and Accessibility APD	3	3.75	42	52.5	35	37.5
Supervision and Enforcement	7	8.75	67	80.75	6	7.5

Table 5. Knowledge Attitude And Compliance Usage of PPE

Variable	n	%
Knowledge		
- Tall	38	47.5
- Low	42	52.5
Attitude		
- Good	47	58.75
- Less	33	41.25
PPE Compliance		
- Obedient	18	22.5
- Non-compliant	62	77.5

Based on Table 5, the level of respondents' knowledge about the use of Personal Protective Equipment (PPE) is still relatively low. This is shown by the percentage of respondents with a low level of knowledge of 52.5%, which is higher than those who have good knowledge (47.5%). In addition, respondents' attitudes towards the use of PPE tend to be more positive, with 58.75% having a good attitude, while 41.25% having a bad attitude. The level of compliance in the use of PPE is still relatively low, Only 18 people (22.5%) are compliant in using PPE, while the majority of respondents, namely 62 people (77.5%), are not compliant.

Table 6. Correlation Test Between Knowledge, Attitudes and Use of Compliance PPE

	PPE Compliance	
	R Count	P-Value
Knowledge	0.267	0.013
Attitude	0.624	0.000

Based on Table 6, related to the Chisquare Test Results, the Relationship between Knowledge and PPE Use Compliance has an r value of 0.267, indicating that the relationship between knowledge and compliance with PPE use is weak. Although this association is statistically significant ($P = 0.013$), it means that there is an influence

positive between the level of knowledge and compliance, but the effect is not too strong, while the relationship between attitude and compliance with PPE use, has an r value of 0.624 indicating that the relationship between attitude and compliance with PPE use is strong. This relationship was also statistically significant ($P = 0.000$), which means that a positive attitude towards PPE use had a greater influence on improving compliance than knowledge

DISCUSSION

The characteristics of the respondents in this study showed that the majority of respondents were male (72.5%) with the highest level of education, namely high school (62.5%). Most respondents were over 30 years old (62.5%) and had less than 5 years of work experience (58%). This suggests that the study population is dominated by male workers with a high level of secondary education and relatively recent work experience. Workers in certain sectors tend to be dominated by men with a secondary level of education [12]. Respondent's level of knowledge regarding the use of the Tool

Personal Protection (PPE) is still relatively low, with

52.5% of respondents have less knowledge. Nevertheless, respondents' attitudes towards the use of PPE tended to be positive (58.75% had a good attitude). However, the level of compliance in the use of PPE is still low, with only 22.5% of respondents compliant. These findings indicate a gap between knowledge, attitudes, and real practices in the use of PPE. Although workers have a positive attitude towards occupational safety, the implementation of safety practices is often inappropriate due to a lack of adequate knowledge and training [13]. The results of the Chi-square test showed that there was a weak relationship between knowledge and compliance with PPE use (r : 0.267), while the relationship between attitude and PPE use compliance was stronger (r : 0.624). These findings suggest that attitudes play a more significant role in the relationship between PPE use compliance than knowledge. Positive attitudes towards occupational safety are a stronger predictor of compliance with the use of PPE compared to the level of knowledge [14].

Development of occupational health sciences and health services. First, the low level of knowledge and compliance with PPE use indicates the need for more intensive educational interventions to improve workers' understanding of the importance of PPE. Second, the finding that attitudes have a stronger relationship with compliance with PPE use confirms the need for an approach that focuses not only on improving knowledge, but also on the formation of positive attitudes through ongoing training and socialization programs.

In addition, the findings on the low level of knowledge and compliance with the use of PPE. It shows that lack of training and socialization on PPE contributes to low compliance rates [15]. the importance of a comprehensive approach to improving occupational safety, which includes

increase knowledge, form a positive attitude, and implement consistent practices. This study also confirms the need for more structured and sustainable interventions to address the gap between knowledge, attitudes, and practices in the use of PPE.

CONCLUSION

Production workers related to a deep understanding of the functions and purposes of using Personal Protective Equipment (PPE), where only 40% of respondents understood this correctly. Meanwhile, the substance they already know is the basic definition of PPE, with 55% of respondents understanding the definition. In terms of attitudes, respondents showed a positive attitude towards the use of PPE, but there were still negative attitudes related to compliance in its use, as evidenced by the low level of compliance which only reached 22.5%. Therefore, the aspect that they have not complied with is in the consistent implementation of the use of PPE in the workplace, although their positive attitude shows the potential to improve compliance if supported by better knowledge and proper training

Adequate ■ For further research, it is recommended that

more intensive and continuous training interventions to improve workers' knowledge and attitudes towards the use of Personal Protective Equipment (PPE),

THANK YOU

The researcher expressed his gratitude to PT. X, the respondents, and the agency supervisors for their support and participation in this study, hopefully the results will be useful for the development of science and the improvement of occupational safety in the industry.

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