

Analysis of Worker Compliance Level in the Use of Personal Protective Equipment (PPE) in The Work Area

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ABSTRACT

This study aims to analyze the level of worker compliance in the use of PPE at PT Ombilin Fusi Nusantara and examine the relationship between age, education level, length of service, knowledge, and attitude towards such compliance. This study uses a descriptive quantitative approach with a cross-sectional method. Data were collected through questionnaires and direct observation of 100 field worker respondents. Data analysis was carried out univariately and bivariate using the Chi-Square test. The results showed that 57% of workers were compliant in using PPE, while 43% were still not compliant. There was a significant relationship between the variables of age, education level, length of service, knowledge, and attitude with the level of compliance in the use of PPE ($p < 0.05$). Attitude and knowledge factors were the dominant aspects that influenced compliance. This study concludes that although most workers have complied with the use of PPE, increased education and supervision are still needed to achieve optimal compliance. It is hoped that the results of this study can be a reference in efforts to improve the implementation of OHS in companies.

Keywords: Compliance, Use of PPE, Occupational Safety and Health, Workplace.

I. Introduction

Recent industrial breakthroughs have influenced the increased implementation of occupational safety management, especially in the industrial sector. To create a safe and healthy workplace, organizations must mitigate the risk of accidents and occupational diseases. Compliance with the use of PPE has shown a decrease in the rate of work-related injuries, as evidenced by a study conducted by Cholia (2024). Enam Prakarsajaya Mandiri showed that consistent use of PPE can significantly reduce the rate of workplace accidents. Occupational Safety and Health (OSH) is a crucial factor in industry, particularly in high-risk sectors like construction and mining. The coal mining sector is characterized by significant hazards and a higher likelihood of workplace accidents. This high risk is evident in the numerous workplace accidents that occur, which are a leading cause of death for workers in the mining sector, particularly in Indonesia. (Fauziah, 2024)

According to data from the International Labour Organization (ILO) found that approximately 380,000 workers, representing 13.7 percent of the total 2.78 million deaths per year, were caused by occupational diseases. A major factor contributing to this increase in frequency is a lack of understanding among companies and workers regarding the importance of implementing Occupational Safety and Health procedures. Meanwhile, approximately 374 million cases of non-fatal occupational injuries and diseases are

recorded annually, significantly impacting worker absenteeism (ILO, 2019). Occupational safety and health (K3) itself is a systematic approach aimed at ensuring the physical and mental safety of workers through compliance with safety standards. With the effective implementation of K3, workers are expected to be able to carry out their duties in safe and comfortable working conditions (Wasty et al., 2021). Furthermore, inadequate compliance with PPE use among workers is often influenced by the perception that PPE can hinder comfort and work efficiency. Many workers perceive the use of PPE as causing discomfort, such as feeling hot, heavy, or inhibited in movement, so they tend not to use it consistently. However, this perception can be minimized through ongoing education and the selection of PPE that is ergonomic and appropriate for the type of work. Companies should not only provide PPE but also conduct intensive socialization and training so that workers understand the importance of PPE for long-term safety.

The Occupational Safety and Health Administration (OSHA) emphasizes that every worker has the right to a safe and healthy workplace. When workplace hazards cannot be completely addressed through engineering or administrative controls, the use of PPE is the last resort. OSHA requires employers to provide workers with compliant PPE, ensure its proper use, and provide adequate training on its use. PPE is designed to protect workers from the risk of injury resulting from exposure to physical, chemical, or biological hazards. Proper use of PPE can significantly reduce workplace accidents and occupational illnesses. (OSHA, 2023). Research conducted by Humairo and Wirahadikusuma (2022) examined the impact of PPE use on workplace accidents among brick industry workers in Tulungagung. Survey data showed that many workers without complete PPE experienced workplace accidents. This study emphasizes the importance of wearing appropriate and complete PPE to prevent workplace accidents. However, worker compliance with PPE use in the field remains a challenge. Further research conducted by Putri (2023) revealed that factors such as age, length of service, knowledge, attitude, motivation, and reward and punishment systems play a role in compliance in the construction sector. Meanwhile, Fenelia & Herbawani (2022) emphasized the importance of management in providing PPE and routine supervision. In the health sector, not only individual factors but also company support are key to improving compliance. Research conducted (Mola, 2020) at PT Wijaya Karya Industri and Konstruksi showed that although workers have good knowledge of PPE, the availability of appropriate and adequate PPE is a barrier to achieving optimal compliance.

II. Literature Review and Hypothesis Development

2.1. Compliance Level

In Indonesian, compliance comes from the phrase "patuh," which means disciplined adherence to directions and norms. Compliance also reflects a person's character, consistently following established rules and procedures and demonstrating positive behavior in adhering to the rules. In sociological literature, the concept of legal compliance is divided into two approaches: instrumental and normative. The instrumental approach assumes that individuals act based on self-interest, while the normative approach emphasizes compliance based on belief in internally held values and norms. Thus, individuals are more likely to obey the law if the rules are perceived as consistent and in line with their values. (Taribaba, 2024) Compliance with the use of PPE is a preventative measure aimed at minimizing workplace accidents, particularly in healthcare settings. Compliance with PPE use is influenced by two main factors: individual awareness and environmental conditions. Environmental aspects, including the availability and use of PPE, also play a role in shaping compliant behavior toward occupational safety procedures. The use of PPE demonstrates an effort to provide physical protection against injury or accidents in the workplace. Therefore, compliance with PPE use is crucial to reducing the risk of workplace accidents. (Wasty, 2021)

A person's compliance with rules, laws, or recommendations is influenced by various internal and external factors. To follow or comply with applicable provisions, some factors that influence compliance are as follows:

a. Knowledge

Knowledge is closely related to worker behavior regarding compliance with the use of PPE in the work area. Adequate knowledge generally indicates excellent compliance with the use of protective equipment.(Wasty, 2021)

b. Attitude

Attitude can be defined as a person's internal response to an object that is not yet directly visible. Attitude also reflects an individual's evaluation and readiness to respond to or interact with the object.(Sutrisno, 2021)

c. Motivation

Motivation is the driving force that influences workers to perform optimally. Motivation is crucial in shaping workers' attitudes and behaviors toward occupational safety, including the use of PPE. It also influences compliance with PPE use in the workplace.(Motivasi, 2025)

d. PPE Comfort

Comfort when using PPE in the workplace also influences employee compliance. PPE that is uncomfortable, ill-fitting, or difficult to use is likely to be inconsistently used by workers.(Putri & Firdaus, 2023)

2.2. Occupational Health and Safety

Occupational Safety and Health is an essential element in the employment framework and vital to maintaining economic activity in the workplace. The enforcement of OHS principles is legally mandated by Law Number 1 of 1970, which affirms that every worker has the right to occupational safety and health protection in carrying out their duties, thereby improving national welfare, productivity, and efficiency. The primary objective of implementing OHS is to protect all individuals in the workplace and ensure the safe and efficient utilization of all production resources.(Darmayanti, 2023)

2.3. Personal Protective Equipment (PPE)

Personal protective equipment (PPE) consists of equipment worn by workers to protect specific parts of the body or the entire body from hazards and potential incidents in the work area. PPE is essential equipment specifically designed to address hazards and associated risks, primarily aimed at protecting workers and the surrounding environment. PPE is used after implementing risk control measures through technical approaches and safe work procedures. PPE that meets standards must be comfortable to wear in various industrial hazards. (Aini & Suwandi, 2023). Personal protective equipment serves as a means of protecting healthcare workers from various potential hazards that may occur during the performance of their duties.

The use of PPE not only provides physical protection but also fosters a sense of security among workers, thereby increasing motivation and promoting optimal health and safety outcomes. Furthermore, PPE plays a crucial role in reducing the risk of transmission of infectious agents, both within the hospital environment and the workplace.(Daeli, 2024) Selecting the right Personal Protective Equipment (PPE) is crucial for implementing Occupational Safety and Health in hazardous environments. PPE serves as the final layer of protection for workers against various potential hazards. Therefore, PPE should be selected with the following considerations in mind:

- a. AP D must be able to provide maximum protection against various specific risks that may arise in the work environment, according to the type of activity and level of risk faced by workers.

- b. PPE should be designed to be lightweight and not hinder movement or interfere with work activities, so that users can continue to work efficiently and productively.
- c. PPE should have a flexible, ergonomic design and follow the contours or anatomy of the user's body to provide optimal comfort.
- d. PPE must not pose additional risks to user safety, be inappropriate materials, or cause errors in use.

According to Rahmawati et al., (2022), The complete and proper use of Personal Protective Equipment (PPE) is crucial for reducing the risk of workplace accidents. In high-risk work environments such as mining, six types of PPE are mandatory:

- e. A safety helmet protects the head from potential hazards in the mining environment. A safety helmet is basic equipment that must be worn upon entering the operational area.
- f. eye protection (safety goggles) To prevent eye injury from splashes of particles, dust, debris, or chemicals.
- g. Respiratory protection (mask) The air in mining areas often does not meet quality standards, so respiratory protection is a priority.
- h. Hand protection (safety gloves). Gloves are used to prevent injury when handling sharp tools, hot objects, or rough surfaces.
- i. Safety clothing (protective clothing). It's a piece of personal protective equipment (PPE) that protects the body from physical risks such as scratches, heat exposure, chemical splashes, and mine dust. In high-risk work environments like mining, safety clothing is equipped with heat-resistant materials or reflective vests to ensure workers remain highly visible.
- j. Safety shoes (safety shoes/boots). Safety shoes protect feet from impacts from heavy objects, being stepped on by sharp objects, and slippery work surfaces.

According to Rahmawati et al., (2022), The factors that influence the level of compliance in the use of PPE are:

a. Knowledge

Knowledge is a crucial factor influencing individual behavior. Knowledge has six levels: recognition, understanding, application, analysis, synthesis, and evaluation. Information or guidance on the importance of PPE use can help workers understand that PPE is crucial for maintaining occupational safety and health from potential workplace hazards.

b. Attitude

Attitude is a person's internal response to an object or stimulus, influenced by ideas and emotions. When workers recognize the importance of PPE, they typically demonstrate acceptance, appreciation, and responsibility. This disposition influences a person's likelihood of adopting a positive attitude and complying with PPE use, or, conversely, adopting a negative attitude and ignoring it.

c. Education

Educational attainment is a determining factor influencing the formation of individual behavior. Education is important for broadening perspectives and shaping individual beliefs and behaviors. Generally, higher educational attainment is associated with an increased ability to understand information and change behavior. Inadequate educational attainment can hinder behavioral change.

d. Years of service

Length of service is one of the worker characteristics that influences behavior formation. The longer a person works, the greater their understanding of work tasks and risks. This is expected to encourage positive behavior, including compliance with PPE use as part of efforts to improve safety and performance.

e. Age

Age is closely related to an individual's level of knowledge, logical thinking, and maturity. As people age, they tend to have a better understanding and increased intelligence. The ability to manage emotions and psychological conditions also improves, which can help reduce the risk of workplace accidents.

Compliance with the use of PPE is very important for the implementation of occupational safety and health. However, worker compliance remains a challenge across various industrial sectors. Workers' knowledge, attitudes, and perceptions significantly influence compliance behavior. Research in South Sulawesi shows that low worker compliance in using PPE has the potential to increase the risk of work accidents that endanger safety. Therefore, an appropriate approach is needed, such as training, outreach, and the implementation of strict sanctions to encourage worker discipline in the use of PPE. (Salcha, 2022)

III. Research Method

The research process begins with preparation, which involves identifying the problem and establishing research objectives. Next, a framework is developed, including the formulation of the variables to be analyzed. The next stage is the research design, where a descriptive quantitative approach is chosen as the main method. Then, an instrument was developed in the form of a questionnaire to measure the level of compliance with the use of PPE by workers at PT Ombilin Fusi Nusantara. The data obtained is then processed at the data analysis stage to describe the level of work compliance in the use of PPE quantitatively. Finally, at the results stage, the findings from the analysis conducted are presented as a basis for conclusions and recommendations. The population in this study includes all field workers at PT Ombilin Fusi Nusantara. Field workers were chosen as research objects because they are the most vulnerable to work accidents and have a direct relationship with the use of PPE. Therefore, it is important to analyze their level of compliance with the use of PPE.

This study uses a cross-sectional approach, where data collection is carried out at a certain point in time. The aim is to obtain a general overview of the level of work compliance in the PT Ombilin Fusi Nusantara environment, as well as to analyze the relationship between the variables studied. The sampling technique used was purposive sampling, a method of selecting samples based on specific criteria established by the researcher. The sample size was set at 100 respondents, reflecting the total population relevant to the study. This study uses univariate and bivariate analysis approaches. Univariate analysis aims to present a general overview of each variable studied, both independent and dependent variables. Meanwhile, bivariate analysis was conducted using the Chi-Square (X^2) test to determine the relationship between the independent and dependent variables. The test results were analyzed based on a p -value ≤ 0.05 , indicating a significant relationship. Meanwhile, $p \geq 0.05$ indicates no significant relationship. This analytical approach was applied in several previous studies highlighting the relationship between age, education, and knowledge on compliance with PPE use in workplaces with high hazard potential (El-Wassab & Triana, 2024).

The questionnaire used in this study was adapted from research by Anggreani (2023). Based on research variables, namely age, length of service, education, knowledge, and attitude, which discussed similar topics regarding compliance with PPE use. The variables for attitude and level of PPE compliance were also examined. Modifications were made to the Likert scale and questions. In the research, the data analysis used was a measurement model test, namely Validity Test, Reliability Test, Univariate Analysis, and Bivariate Analysis.

Table 1. Sample Criteria (N = 256)

Measurement	N	%
Gender		
Man	128	50
Female	128	50
Age (years-old)		
30 – 35	30	11.7
36 – 40	112	43.8
41 – 45	53	20.7
> 45	61	23.8
Academic Grade		
Assistant Professor	172	67.1
Associate Professor	82	32
Professor	2	0.7
Length of Work (years)		
3 – 5	16	6.25
5 – 8	60	23.4
> 8	180	70.3
Education Level		
Magister		
Doctoral		

IV. Result and Discussion

4.1. Result

a. Univariate Analysis

Univariate analysis to describe the characteristics of each variable from the research results, consisting of age, education level, length of service, knowledge, attitude, and compliance in the use of PPE.

1) Worker Age

Table 1. Frequency Distribution of Worker Age

No	Worker Age	n	%
1	20 – 30 Years	50	50.0
2	31 – 40 Years	30	30.0
3	41 – 50 Years	20	20.0
	Total	100	100.0

Based on Table 1, 50 respondents (50.0%) were in early adulthood, 30 respondents (30.0%) were in middle adulthood, and 20 respondents (20.0%) were in late adulthood. The majority of respondents were aged 20-30 years, indicating that the majority were in early adulthood with a relatively high distribution.

2) Level of education

Table 2. Distribution of Education Levels

No	Level of education	n	%
1	Low.	15	15.0
2	Intermediate.	67	67.0
3	Tall.	18	18.0
	Total	100	100.0

Based on Table 2 shows that 15 respondents (15.0%) had a low level of education, 67 respondents (67.0%) had a secondary education, and 18 respondents (18.0%) had a high level of education. The majority of respondents indicated that most of them had a secondary level of education, with a relatively high distribution.

3) Years of service

Table 3. Distribution of Working Period

No	Years of service	n	%
1	≥ 3 years	58	58.0
2	< 3 Years	42	42.0
	Total	100	100.0

Based on Table 3, 58 respondents (58.0%) had a working period of ≥ 3 years, and as many as 42 respondents (42.0%) had a working period of < 3 years. The majority of respondents had worked for ≥ 3 years, which shows that most have relatively long work experience.

4) Knowledge

Table 4. Distribution of Employee Knowledge

No	Worker Knowledge	n	%
1	Not good	38	38.0
2	Good	62	62.0
	Total	100	100.0

Source: Primary Data 2025

Based on Table 4, 38 respondents (38.0%) were in the less knowledgeable category, and 62 respondents (62.0%) were in the less knowledgeable category. Good knowledge category in the use of PPE. The majority of respondents indicated that most had good knowledge, with a relatively high distribution.

5) Attitude

Table 5. Distribution of Worker Attitudes

No	Worker Attitude	n	%
1	Negative	23	23.0
2	Positive	77	77.0
	Total	100	100.0

Based on Table 5, 23 respondents (23.0%) had negative attitudes, while 77 respondents (77.0%) had positive attitudes. The majority of respondents indicated a positive attitude, with a relatively high distribution.

6) Compliance in Using PPE

Table 6. Distribution of Compliance in the Use of PPE

No	Compliance with the Use of PPE	n	%
1	Not obey	43	43.0
2	Obedient	57	57.0
	Total	100	100.0

Based on Table 6, 43 respondents (43.0%) were categorized as non-compliant, and 57 respondents (57.0%) were categorized as compliant. The majority of respondents indicated that they had a relatively high level of compliance.

b. Bivariate Analysis

1) Relationship between Age and Compliance with APD Use

Table 7. Relationship between Age and Compliance with PPE Use

Age	Compliance with the Use of PPE				Total	P-value		ORCI (95%)
	No Obedient		Obedient					
	n	%	n	%	n	%		
≥ 35 Years	24	16.8	15	22.2	39	39.0	0.005	0.506 (0.323-0.792)
< 35 Years	19	26.2	42	34.8	61	61.0		
Total	43	43.0	57	57.0	100	100.0		

Based on Table 7 cross-tabulation between worker age and compliance with PPE use, it is known that workers aged ≥ 35 years with non-compliant PPE use were 24 respondents (16.8%), while workers aged < 35 years with non-compliant PPE use were 19 respondents (26.2%). Based on the results of the chi-square test, the P-value is 0.005 (< 0.05), which means there is a significant relationship between the age of workers and the level of compliance in the use of PPE. From the results of the analysis, the OR value is 0.506 (95% CI = 0.323-0.792), meaning that workers aged ≥ 35 years have a protective factor of 0.506 times the chance of complying with the use of PPE compared to workers aged <35 years at PT. Ombilin Fusi Nusantara.

2) Relationship between Education Level and PPE Compliance

Table 8. Relationship between Education Level and Compliance

Education	Compliance with the Use of PPE				Total	P-value		ORCI (95%)
	No Obedient		Obedient					
	n	%	n	%	n	%		
Low	11	6.5	4	8.5	15	15.0	0.022	1,948 (1,293-2,935)
Tall	32	36.6	53	48.4	85	85.0		
Total	43	43.0	57	57.0	100	100.0		

Based on Table 8, the cross-tabulation between workers' education level and compliance with PPE use, it is known that low education with non-compliant PPE use was 11 respondents (6.5 %), while high education with non-compliant PPE use was 32 respondents (36.6%). Based on the results of the chi-square test, the P-value is 0.022 (< 0.05), which means there is a significant relationship between the level of worker education and the level of compliance in the use of PPE. From the analysis results, the OR value is 1.948 (95%

CI = 1.293-2.935), indicating that workers with low education have a 1.948 times greater risk of non-compliance in the use of PPE compared to workers with higher education at PT. Ombilin Fusi Nusantara.

3) Relationship between Work Period and Compliance with PPE Use

Table 9. Relationship between Work Period and Compliance with PPE Use

Years of service	Compliance with the Use of PPE				Total	P-value		OR CI (95%)
	No Obedient		Obedient					
	n	%	n	%	n	%		
≥ 3 Years	28	24.9	30	33.1	39	58.0	0.295	0.740 (0.455-1.202)
<3 years	15	18.1	27	23.9	42	42.0		
Total	43	43.0	57	57.0	100	100.0		

Based on Table 9 cross-tabulation between work period and compliance with PPE use, it is known that the period ≥ 3 years with non-compliant PPE use was 28 respondents (24.9%), while the period < 3 years with non-compliant PPE use was 15 respondents (18.1%). Based on the results of the chi-square test, the P-value is 0.295 (> 0.05), which means there is no significant relationship between length of service and the level of compliance in the use of PPE. From the results of the analysis, the OR value = 0.740 (95% CI = 0.455-1.202) is obtained, indicating that workers with a work period of ≥ 3 years have a 0.740 times greater risk of compliance in the use of PPE among workers at PT. Ombilin Fusi Nusantara.

4) Relationship between Knowledge and Compliance with PPE Use

Table 10. Relationship between Knowledge and Compliance with the Use of PPE

Knowledge	Compliance with the Use of PPE				Total	P-value		ORCI (95%)
	No Obedient		Obedient					
	n	%	n	%	n	%		
Not good	24	16.3	14	21.7	38	38.0	0.003	2,061 (1,319-3,220)
Good	19	26.7	43	35.3	62	62.0		
Total	43	43.0	57	57.0	100	100.0		

Based on Table 10 known that worker knowledge is poor with non-compliant use of PPE, namely 24 respondents (16.3%), while worker knowledge is good with non-compliant use of PPE, as many as 19 respondents (26.7%). Based on the results of the chi-square test, the P-value is 0.003 (< 0.05), which means there is a significant relationship between knowledge and the level of compliance in the use of PPE. From the results of the analysis, the OR value = 2.061 (95% CI = 1.319-3.220) was obtained, indicating that workers with poor knowledge have a 2.061 times greater risk of non-compliance compared to workers with good knowledge in the use of PPE at PT. Ombilin Fusi Nusantara.

5) Relationship between attitude and compliance with PPE use

Table 11. Relationship between Attitude and Compliance with the Use of PPE

Attitude	Compliance with the Use of PPE				Total	P-value		OR CI (95%)
	No Obedient		Obedient					
	n	%	n	%	n	%		
Negative	16	9.9	7	13.1	23	23.0	0.007	2,980 (1,984-1,321)
Positive	27	33.1	50	43.9	77	77.0		
Total	43	43.0	57	57.0	100	100.0		

Based on Table 11 cross-tabulation between worker knowledge and compliance with the use of PPE, it is known that workers' attitudes were negative with non-compliant use of PPE, namely 16 respondents (9.9%), while workers' attitudes were positive with non-compliant use of PPE, as many as 27 respondents (33.1%). Based on the results of the chi-square test, the P-value is 0.007 (< 0.05), which means there is a significant relationship between attitudes and the level of compliance in the use of PPE. From the results of the analysis, the OR value = 2.980 (95% CI = 1.984-1.321) was obtained, indicating that workers with negative attitudes have a 2.980 times greater risk of non-compliance compared to positive attitudes in the use of PPE among workers at PT. Ombilin Fusi Nusantara.

4.2. Discussion

a. Relationship between Age and Compliance with PPE Use

Based on the results of the analysis using the Chi-Square test, a p-value of 0.005 ($p < 0.05$) was obtained, which indicates that there is a significant relationship between the level of knowledge and compliance in the use of PPE. In addition, the results of the analysis show that the value (OR) is 0.506 with (95% CI = 0.323-0.792), in the use of PPE among workers at PT. Ombilin Fusi Nusantara. These results align with those of Ardiansyah (2021), who studied the PT. Duta Permata Lestari water bridge construction project in Ogan Komering Ilir (OKI) Regency. A strong relationship was identified between age and compliance with PPE use, with a p-value < 0.001 . And in line with research conducted by R. Rahmawati & Pratama (2022), The age of workers was proven to influence compliance with the use of PPE, as indicated by the significance value of $p = 0.001$ in the subsequent construction project research conducted by Mulyadi (2024), This revealed that age is an important predisposing factor in compliance with the use of PPE.

Conceptually, as a person ages, they typically experience increased maturity and awareness of occupational safety. This, in turn, influences their perception of the urgency of appropriate and consistent use of PPE in the workplace. More experienced workers tend to be more vigilant in identifying hazards and understand the importance of PPE use. Conversely, younger workers often lack a full understanding of the consequences of various occupational risks, resulting in lower levels of PPE compliance. Longer work experience fosters a more cautious attitude and an understanding of the importance of self-protection. Late adults tend to be more responsible, resulting in greater compliance with PPE use. This suggests that age is a significant factor in increasing compliance with PPE use in the workplace.

b. Relationship between Work Period and Compliance with PPE Use

Based on the results of the analysis using the Chi-Square test, a significance value of $p = 0.295$ ($p > 0.05$) was obtained, which means there is no significant relationship between the level of knowledge and compliance with the use of PPE among workers at PT. Ombilin Fusi Nusantara. These results are in line with the findings of Aditia et al. (2021), who found no significant relationship between length of service and compliance with PPE use, with a p-value of 0.863. However, these results differ from the findings of research conducted by Utari et al. (2020), which showed a significant correlation between length of service and the level of compliance with PPE use, with a significance value of $p = 0.041$. And strengthened by the findings of a study at Palembang Bari Regional Hospital (2024), which showed that length of service was not a significant variable in influencing compliance with PPE use. The study found that both long-tenured and new workers had varying levels of compliance.

These findings indicate that length of service is not always directly proportional to increased awareness or commitment to implementing occupational safety procedures. In some conditions, workers with longer working periods actually show a decrease in alertness due to a sense of familiarity or overconfidence, which then has an impact on neglecting the use of PPE. In contrast, new workers who have undergone intensive safety training and have positive knowledge and attitudes often demonstrate better levels of compliance with PPE use. Therefore, the length of service cannot be used as the sole indicator in assessing the level of compliance with occupational safety. It is important for companies to pay attention to

ongoing training, strengthening safety culture, and periodically evaluating workers' knowledge and attitudes, without differentiating based on length of service. Training and supervision programs must be implemented evenly for all workers, both new and old, to ensure consistency in the application of occupational safety principles, including the proper and routine use of PPE.

c. The Relationship between Education and Compliance with PPE Use

Based on the results of the analysis using the Chi-Square test, a p-value of 0.022 ($p < 0.05$) was obtained, which indicates that there is a significant relationship between education level and compliance in the use of PPE. In addition, the results of the analysis show that the value (OR) of 1.948 with (95% CI = 1.293-2.935), in the use of PPE by workers at PT. Ombilin Fusi Nusantara. These results align with research conducted by Rahmawati (2020), which explored the relationship between knowledge, education level, and training on the level of compliance with PPE use among street sweepers in Bangkinang Kota District. The results showed a significant relationship between education level and compliance with PPE use, with a significance value of $p = 0.002$. These results are also supported by a study conducted by Syekura (2021), which found a relationship between education level and compliance with PPE use in a shipyard work environment.

A higher level of education usually increases the understanding of professional safety knowledge, especially regarding the importance of using PPE. Education plays a role in shaping better knowledge and perceptions regarding the implementation of safety procedures. Individuals with higher education generally demonstrate improved literacy skills, making it easier to understand safety instructions, warning symbols, and workplace training materials. This makes them more aware of the potential risks and hazards of improper PPE use. Education level greatly influences workers' perception and understanding of the importance of maintaining occupational health and safety. Educated workers tend to have a more rational view of risk and are able to make better decisions in work situations that require caution. They are also more open to innovations or new policies related to occupational safety, including the use of personal protective equipment that meets standards. A person's educational background can influence the level of compliance with the use of PPE.

d. Relationship between Knowledge and Compliance with PPE Use

Based on the results of the analysis using the Chi-Square test, a p-value of 0.003 ($p < 0.05$) was obtained, which indicates that there is a significant relationship between the level of knowledge and compliance in the use of PPE. In addition, the results of the analysis show that the value (OR) is 2.061 with (95% CI = 1.319-3.220), in the use of PPE by workers at PT. Ombilin Fusi Nusantara. These results align with research conducted by Adriansyah (2021), which stated a significant relationship between knowledge and compliance in PPE use, as indicated by a p-value of 0.004. This finding is also supported by a study conducted by Wahyudi et al. (2024) at PT. Asta Rekayasa Unggul, Kutai Kartanegara, showed similar findings regarding the relationship between knowledge and compliance in PPE use. The study explains that workers with a good understanding of occupational risks and personal protective equipment tend to be more compliant with safety procedures, including the consistent and appropriate use of PPE. Furthermore, research conducted by Nuraeni et al. (2025) on healthcare workers in inpatient wards also revealed that knowledge is a factor influencing compliance with PPE use, with a significance value of $p < 0.05$.

Knowledge has a crucial role in shaping occupational safety behavior. Workers who understand the potential risks and significance of PPE use demonstrate higher levels of compliance. Adequate knowledge helps individuals identify workplace hazards, understand the function and proper use of PPE, and recognize the potential negative impacts of negligence. With this understanding, workers will be more motivated to voluntarily and consistently comply with safety procedures. Furthermore, adequate knowledge contributes to fostering individual awareness of the importance of maintaining health and safety at work. Workers who have an accurate and comprehensive understanding of the appropriate types of PPE for their jobs, as well as the correct procedures for their use, will be more careful in making daily operational decisions. This understanding not only reduces the potential for workplace accidents but also strengthens the

implementation of a safety culture in the workplace. The importance of knowledge is also evident in the effectiveness of occupational safety training programs. Numerous studies, including this one, have shown that training can improve workers' understanding, ultimately leading to increased compliance with PPE use. Therefore, companies need to consistently strive to increase knowledge through regular education, structured training, and the provision of easily accessible safety information in order to realize sustainable workforce protection.

e. Relationship between Attitude and Compliance with PPE Use

Based on the results of the analysis using the Chi-Square test, a p-value of 0.007 ($p < 0.05$) was obtained, which indicates that there is a significant relationship between attitudes and compliance in the use of PPE. In addition, the analysis also shows that the OR value is 1.984 with (95% CI = 1.321-2.980), in the use of PPE by workers at PT. Ombilin Fusi Nusantara. This result is in line with Salsabila Aisyah's research, (2025), which found that attitudes had the strongest correlation with compliance with PPE use ($r = 0.624$; $p = 0.000$). In addition, another more recent study from 2023 at Sungai Lilin Regional Hospital, Musi Banyuasin Regency, also proved a significant relationship between attitudes and actions with compliance with PPE use, with a p-value = 0.036 for attitudes and $p = 0.016$ for actions.

Attitude can be defined as a person's readiness to act in a given situation. Workers who demonstrate a positive attitude toward occupational safety tend to be highly aware of potential hazards, making them more proactive in taking preventative measures, including the use of PPE. This attitude generally stems from an internal drive, a sense of responsibility for the safety of themselves and others in the workplace. Therefore, compliance with PPE use is not simply a result of regulatory pressure, but rather a reflection of commitment. Furthermore, findings from Muhammadiyah University of Gresik in 2025 indicated a fairly strong relationship between attitude and compliance ($r = 0.624$), indicating that attitude plays not only a supporting role but also a central component in building a solid occupational safety culture. This is reinforced by data from Sungai Lilin Regional Hospital, which shows that an increase in positive attitudes and preventative behavior significantly impacts the level of worker compliance in the use of PPE. In practical terms, these findings have implications for companies' strategies in designing workplace safety interventions. Safety training should not be limited to merely conveying technical aspects, but should also include instilling positive safety values, strengthening intrinsic motivation, and establishing social norms that encourage compliance with PPE use. With this approach, workers not only understand the technical aspects of "what" and "how" to use PPE, but also develop a sense of responsibility, confidence, and awareness of the importance of these practices for collective safety in the workplace.

V. Conclusion

The results of the study regarding worker compliance in using Personal Protective Equipment (PPE) at PT Ombilin Fusi Nusantara show that the majority of workers (57%) fall into the compliant category, while 43% are considered non-compliant. Although more than half of the workers follow PPE requirements, the number of non-compliant workers remains relatively high, indicating the need for stronger efforts to improve overall compliance and occupational safety. The study also found a significant relationship between worker demographics and compliance levels. Age was proven to influence compliance, with a p-value of 0.005 ($p < 0.05$). Workers aged ≥ 35 years showed a greater likelihood of being non-compliant compared to younger workers. Similarly, education level showed a significant association with compliance ($p = 0.022$). Workers with lower educational backgrounds had a two-times higher risk of non-compliance compared to those with higher education. These findings suggest that personal characteristics play an important role in workers' adherence to safety protocols.

In contrast, length of service did not show any significant relationship with PPE compliance, as indicated by a p-value of 0.295 ($p > 0.05$). This means that having longer work experience does not necessarily ensure better compliance. Workers with both short and long tenures may exhibit similar safety behavior,

implying that experience alone is not a determining factor in PPE usage. Knowledge and attitudes, however, demonstrated strong associations with compliance. Workers with poor knowledge about PPE were found to have a two-times higher risk of non-compliance ($p = 0.003$). Additionally, worker attitudes significantly affected PPE use, with those displaying negative attitudes being more likely to disregard PPE requirements ($p = 0.007$). These findings indicate that cognitive and psychological factors greatly influence safe work practices. Based on these results, several recommendations can be made to enhance workplace safety. Continuous education and training should be implemented to improve workers' knowledge and awareness of PPE importance. Providing PPE that is comfortable and easy to use may also help increase compliance, especially among older workers. Moreover, efforts to foster positive attitudes toward safety—such as safety campaigns, behavioral interventions, and supportive supervision—are essential. Overall, the findings of this study can serve as a basis for developing more targeted occupational safety policies to create a safer and more productive work environment.

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