



## **The Relationship Between Working Period and Comfort of Personal Protective Equipment (PPE) With Compliance Behavior of Using PPE In Cut Area Workers**

### **PT. Cahaya Bintang Olympic**

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### **Abstract**

*PT Cahaya Bintang Olympic is one of the furniture processing industries with a high risk of accidents and occupational illnesses, particularly in the cutting area. One safeguard for workplace safety and health is the company's requirement to utilize Personal Protective Equipment (PPE). The aim of this study is to determine and examine how workers' compliance with PPE use in the cutting area is impacted by their comfort level and length of service. 36 workers made up the sample for this cross-sectional study, which employed an analytical descriptive method. Compliance with PPE use is the dependent variable, whereas duration of service and comfort level with PPE use are the independent variables. Questionnaires and observation sheets were used to gather data, and the chi-square test was used for analysis. According to the findings, the majority of employees fell into the long tenure category (52.8%), felt at ease using personal protective equipment (72.2%), and cooperated with PPE use (83.3%). PPE comfort with compliance with PPE use ( $p = 0.000$ ) and length of service are significantly correlated with compliance with PPE use ( $p = 0.005$ ). To maintain the comfort level of PPE use, it is advised that businesses enhance PPE comfort through suitable testing and changes.*

**Keywords:** *Cutting Area Workers, Length of Service, PPE Comfort, PPE Use Compliance.*

### **INTRODUCTION**

Occupational safety and health (OSH) in Indonesia is an important issue, given the high number of work activities that have potential hazards. Occupational diseases can arise due to factors from workers and the work environment, such as dust, smoke, gas, and other elements that can damage health and reduce productivity. Safe and comfortable working conditions support employees in carrying out their duties optimally (Muhith et al., 2018).

In addition to reducing the risk of work accidents and occupational diseases (PAK), the implementation of Occupational Safety and Health (K3) seeks to provide a safe, healthy, and pollution-free workplace. Unwanted and unexpected incidents, work accidents can result in money loss, time loss, and perhaps fatal consequences. (Wahyudi et al., 2024).

Labor is an important asset in the production process. Therefore, their health and safety must be maintained through the provision of PPE. The use of PPE is the last solution after elimination, substitution, engineering, and administrative efforts have been optimized (Isnaeni, 2023).

Based on data from BPJS Ketenagakerjaan, every year there are around 130,000 cases of work accidents, which include minor injuries to death cases. The number of reported accidents fluctuates, from 231,041 cases in 2017 down to 173,105 cases in 2018. However, in 2019 the number rose again from 114,000 to 177,000 cases in 2020, showing an increase of 55.2%. Meanwhile, from January to September 2021, there were around 82,000 cases of work accidents. Of this total, 25.77% were traffic accidents, 8.33% occurred outside the work area, and the majority, 65.89%, occurred within the work environment (Febriani, 2023).

According to the Health Belief Model (HBM) theory, a person's health habits are influenced by their perception of risks and benefits. Employees' perception of hazards may be influenced by length of service and PPE comfort, which in turn affects PPE compliance.

Previous studies have shown mixed results regarding the relationship between tenure and compliance with PPE. At PT Industri Kapal Indonesia, a significant relationship was found ( $p = 0.001$ ), while at Zainoel Abidin Hospital, compliance increased with length of service. This difference encourages the need for further research (Sartika et al., 2024).

This is in line with research (Daniel Ginting & Nina Fentiana, 2024), because the longer the working period, the more experienced in completing tasks, so the length of service also affects the compliance of Puskesmas officers in implementing the SOP.

PT Cahaya Bintang Olympic's work area, especially the cutting section, has a high risk due to exposure to wood particles, cutting machines, and sharp tools. Comfort in the use of PPE is an important aspect besides working hours in influencing compliance.

However, there is still a limited number of studies exploring the link between personal protective equipment (PPE) comfort and working hours in the furniture industry, especially in high-risk areas such as the cutting department. To fill this knowledge gap and support the development of evidence-based occupational safety policies, this study is highly relevant. Therefore, this study aims to examine the relationship between the duration of working hours and the comfort level of PPE on workers' compliance in using PPE in the cutting area of PT Cahaya Bintang Olympic.

Because PT Cahaya Bintang Olympic operates in the furniture industry sector, which has a high risk of work accidents, particularly in the cutting section, research on the relationship between tenure and comfort of personal protective equipment (PPE) and PPE compliance behavior in cutting area workers is crucial. Because of the risks associated with this region, including exposure to wood chips, sharp cutting tools, dust, and machine noise, personal protective equipment (PPE) is essential.

However, the level of worker compliance with the use of PPE is influenced by comfort and length of service. Workers with longer tenure tend to have different habits and perceptions of work risks than new workers. On the other hand, PPE comfort directly affects workers' motivation to wear it consistently.

This research provides a clear picture of the importance of ergonomic PPE design and an effective supervision system so that workers feel safe, comfortable and remain productive. More broadly, this research is also important for other furniture industries because it can serve as a model for implementing work safety based on a behavioral approach. These findings encourage PPE manufacturers to design equipment that is more suitable for the needs of the field, as well as the basis for formulating work safety policies

in the manufacturing sector. Thus, this research not only provides practical benefits for PT Cahaya Bintang Olympic, but also has theoretical and strategic contributions to the strengthening of OSH culture in the national furniture industry (Chiara et al., 2025).

The cutting area in the furniture industry such as at PT Cahaya Bintang Olympic is the most hazardous part of the production process because it involves the use of heavy machinery and sharp cutting tools. Work risks in this area are very specific and real.

Some workers come face to face with table saws, bandsaws, circular saws, or fast-spinning CNC machines. The slightest mistake can lead to: Serious cuts or amputation of fingers/hands and Puncture wounds from sharp objects.

Work risks in the cutting area are not just limited to minor injuries or discomfort, but include severe injuries to chronic diseases and fire risks, so the implementation of OHS, especially compliance with the use of PPE is very important. This research plays a role in providing data and a scientific basis for companies to take corrective and preventive measures based on evidence (evidence-based prevention).

## RESEARCH METHOD

Because it can explain the relationship between tenure and comfort level in using personal protective equipment (PPE) and its compliance at a single point in time, this study used a cross-sectional method and a descriptive analytical design. Despite its shortcomings in demonstrating clear cause-and-effect links, this design was selected because it is thought to be efficient with regard to time and resources. The survey, which included a sample of 36 workers and the entire populace, was carried out in May 2025 in the cutting area of PT Cahaya Bintang Olympic.

Total sampling, in which every member of the population served as a research sample, was the sampling strategy employed in this investigation. Questionnaires and observation sheets were the tools utilized. The length of service and reported comfort of wearing personal protective equipment (PPE) were measured using a questionnaire that asked about size, material, and ease of movement. In the meantime, observation sheets were utilized to evaluate PPE compliance using metrics related to completeness, wearing duration, and consistency during working hours. The SPSS software was used to examine the instruments' validity and reliability once they were developed using pertinent references. The questionnaires were completed during breaks or before leaving work, while the observations were hidden for one week to avoid bias in worker behavior.

Giving respondents their informed consent prior to their completion of the questionnaire was one of the research ethics criteria that were prioritized throughout the entire data collection process in this study. By making sure that the test requirements—such as categorical data types and a sufficient minimum number of frequencies in each cell of the contingency table—were met, data analysis was carried out using the Chi-Square test to determine the relationship between the variables under study. The dependent variable in this study was PPE use compliance, while the independent variables were duration of service and comfort level.

## RESULTS

Table 1. Frequency Distribution of Working Period, PPE Comfort, and PPE Use Compliance

Variable	Category	Total	Presentation
Length Of Service	New (≤ 3 Years)	17	47,2%
	Old	19	52,8%

		(> 3 Years)			
		Comfortable	26		
PPE Comfort	Uncomfortable	10	27,8%		
	Compliant	30	83,3%		
PPE Compliance	Not Compliant	6	16,7%		

The staff was arranged in Table 1 based on their length of service, degree of PPE comfort, and compliance with PPE use. According to the working term component of the survey, 19 employees (52.8%) were categorized as elder workers who had been employed for more than three years. Finally, most employees (up to 30 people, or 83.3%) followed the regulations that mandated wearing personal protective equipment (PPE) at work. This indicates that workers are relaxed and unfazed when donning personal protective equipment (PPE).

According to Table 1's frequency distribution of PPE compliance, 30 employees (83.3%) were classified as complying, whereas 6 employees (16.7%) were classified as non-compliant. Assessing how successfully PT Cahaya Bintang Olympic staff in the Cutting Area follow the company's standard operating procedures (SOPs) on the usage of personal safety equipment (PPE) is the main objective of this study.

Table 2. Relationship between Comfort Level of Cutting Area Workers with PPE Factors and Working Period at PT. Cahaya Bintang Olympic

Variable	PPE Compliance				Total		p-value
	Compliant	n	%	Not Compliant	n	%	
<b>Length Of Service</b>							
New (<= 3 Years)	11	64,8%		6	35,2%	17	100% 0,005
Old (> 3 Years)	0	0%		19	100%	19	100%
<b>PPE Comfort</b>							
Comfortable	26	100%		0	0%	26	100% 0,000
Uncomfortable	4	40%		6	60%	10	100%

Table 2 shows that the majority of workers who were compliant in using Personal Protective Equipment (PPE) came from the group with a relatively short working period ( $\leq 3$  years), as many as 64.8% of the total respondents, while all workers who were not compliant were in the working period group of more than three years. This suggests that tenure is related to the level of compliance with PPE use. This finding was reinforced by the results of the Chi-Square test which showed a p value of 0.005 ( $p < 0.05$ ), indicating a statistically significant relationship. In addition, comfort in the use of PPE was also shown to affect compliance. Workers who felt comfortable while using PPE were more likely to comply, while 60% of those who felt uncomfortable did not use it consistently. A Chi-Square test of this variable also showed a significant relationship ( $p = 0.000$ ). Thus, both tenure and comfort level were shown to be factors that significantly influence workers' compliance with PPE use in the workplace.

## DISCUSSION

### Work period, comfort, and PPE compliance of workers in the cutting area of PT. Cahaya Bintang Olympic

One element that influences the quality of work performed by employees in a company is length of service. If the organization does not take this into account, employee performance may increase or decrease. Measuring employee performance is necessary to determine whether a company is experiencing an increase or decrease in production (Jayanti & Dewi, 2021).

According to opinions in research (Setiawan & Febriyanto, 2020), Employee loyalty to the organization can also be interpreted as length of service, as employees who have worked for a long time usually show high levels of productivity. One factor that influences compliance is the length of one's tenure; janitors who have a lot of experience will carry out their duties based on their work habits, including the use of personal protective equipment (PPE).

Based on the results of the study, most employees 19 people (52.8%) and 17 people (47.2%) who were classified as new employees - had worked in the company for more than three years. The average tenure of employees in the company is in the range of five to six years. This data is consistent with the finding that of the 32 respondents with more than five years of service, 18 (56.25%) were identified. Length of service plays a role in shaping employees' knowledge level regarding the use of Personal Protective Equipment (PPE). Generally, employees with longer tenure have more extensive experience in dealing with work situations that require the use of PPE, thus strengthening their understanding of the importance of PPE and how to use it properly (Maryam et al., 2024).

The aspect of comfort is one of the many causes of employee non-compliance in the use of personal protective equipment (PPE). For example, workers will not be adequately protected with safety shoes that are too big or too small, but they may prevent new incidents from occurring due to the ill-fitting size (Mulyadi, 2024). There is a wide range of PPE available for work wear, such as dust or gas masks, safety helmets, safety shoes or rubber boots, goggles, and work clothes for required PPE.

Discomfort can lead to resistance or reluctance to use PPE consistently because it interferes with physical comfort while working, such as heat, tightness, heaviness, or limited movement. In the context of manual work such as in the cutting area, this discomfort can be perceived as an obstacle to completing tasks quickly and efficiently. This is in line with the Health Belief Model (HBM) theory, where perceived barriers, including discomfort, can decrease a person's propensity to take precautions such as PPE use. The findings of this study support this mechanism, where of the 10 workers who felt uncomfortable using PPE, 60% of them (6 people) showed non-compliant behavior towards PPE use. In contrast, in the group that felt comfortable (26 workers), the majority (72.2%) were compliant in the use of PPE. This suggests that perceived comfort is an important factor in shaping workers' compliance with work safety procedures.

To keep healthcare professionals safe, healthy, secure and productive at all times, PPE is used to protect them from potential risks. Unexpected events occur when PPE is not used, leading to occupational accidents. These events are called unexpected because they always result in significant and unexpected losses and have no obvious cause. Occupational accidents and diseases can be prevented by ensuring that workers wear PPE in accordance with company policy. Those who are knowledgeable and positive are more likely to follow the guidelines and wear personal protective equipment. The level of compliance, where respondents are more likely to use PPE, can also be influenced by the availability of adequate personal protective equipment (PPE) and thorough and regular supervision. The study findings show that while most employees use personal protective equipment (PPE) in the workplace, 30 employees (83.3%) and 6 employees (16.7%) do not use it.

### **The relationship between tenure and compliance with PPE use**

Individual employee characteristics, such as length of service, in this study were divided into two categories: new and old. The results in Table 5 show that 64.8% of workers who were compliant with the use of personal protective equipment (PPE) had a recent tenure ( $\leq 3$  years). On the other hand, 100% of individuals who worked without

using safety equipment (PPE) had worked for more than three years. Moreover, the correlation between length of service and compliance with PPE was established by Spearman's statistical test. Table 2 provides confirmation of this, as the p value found was  $0.005 > 0.05$ . Research suggests that new employees are less experienced and slow to react to hazards and indications of accidents in the workplace because experience, after all, makes one more alert. This is in line with the research (Utami et al., 2020). Based on the results of bivariate analysis using the Chi-Square test, it is proven that length of work ( $p = 0.041$ ) and compliance with PPE use have a relationship. The results of this study are also in accordance with research (Sapitri et al., 2020), which shows a strong correlation between field workers' compliance with the use of PPE and length of work at PT Anugeraah Generasi Bersama Banjarmasin.

### **Relationship between PPE Comfort and PPE Use Compliance**

One of the key elements in this study is the degree of comfort with which one uses Personal Protective Equipment (PPE), which is divided into two categories: comfortable and uncomfortable. The majority of employees who feel at ease wearing PPE typically exhibit complete compliance during working hours, according to the data in Table 2. On the other hand, 60% of employees who experienced discomfort did not use personal protective equipment (PPE). With a p value of 0.000 ( $p < 0.05$ ), the Spearman test statistical analysis revealed a substantial correlation between PPE comfort level and compliance behavior (Table 2). The Chi-Square test, which similarly produced a p value of 0.000, supported this finding and showed a significant relationship between respondents' degree of compliance and how comfortable they were using PPE. (Rahmawati et al., 2024). This result is consistent with earlier studies that indicated a similar association between comfort and PPE compliance, such as a study of dump truck operators at PT X, which likewise reported a p value of 0.000 in the correlation analysis.

Employees are comfortable with personal protective equipment (PPE) because they feel safe when doing so, especially when cutting. Because PPE is difficult, troublesome and annoying to use while working, many respondents feel uncomfortable and do not want to use it. According to the research findings on the relationship between cutting area workers' comfort level with PPE and PPE use, many workers still experience discomfort when wearing PPE.

According to (Chiara et al., 2025), The comfort and availability of PPE also have a major influence on compliance, with low compliance rates, especially in the informal sector, attributed to the discomfort of wearing PPE and its limited availability. Therefore, to increase employee compliance with PPE use, companies or organizations must ensure that the equipment provided is adequate and comfortable for employees to use.

Therefore, in accordance with Permenakertrans No. 8/2010, businesses and partners should optimize PPE management approaches to create a sense of comfort for workers so that they have a positive attitude and remain consistent in wearing PPE. In addition, proper fitting and testing can be done when selecting PPE, in particular by asking suppliers to provide PPE advice by making physical test samples. Before supplying PPE, suppliers should consider ensuring the design is ergonomic, as this can affect workers' perceptions of the increased usefulness and usability of PPE (Sukma Ika Noviarmi & Hamengku Prananya, 2023).

The results showed a significant relationship between the length of service and the comfort level of using Personal Protective Equipment (PPE) with workers' compliance in using it. This finding indicates that the longer a person works, the tendency to neglect the use of PPE increases. One possible cause is excessive self-confidence due to long work experience, so the perception of risk tends to decrease. This situation is in line with the

concept of habituation theory, where workers become accustomed to the conditions of the work environment and begin to feel that the consistent use of PPE is not always necessary.

In addition, comfort in the use of Personal Protective Equipment (PPE) was shown to play a significant role in influencing workers' compliance levels. Workers who feel comfortable while wearing PPE tend to be more consistent in its use compared to those who feel uncomfortable. This finding is in line with the Health Belief Model (HBM) approach, which emphasizes that perceived barriers-including physical discomfort-can be a barrier for individuals to take preventive or protective measures, such as using PPE. Therefore, the physical comfort factor needs to be a major concern in the formulation and implementation of OHS policies in the work environment.

In terms of implementation, these findings provide important input for PT Cahaya Bintang Olympic. First, the company needs to re-evaluate the types and specifications of PPE provided to suit the needs of workers, both in terms of size, material, and ergonomic comfort. Second, it is important for the company to organize retraining for employees with a longer tenure to refresh their knowledge about occupational risks and the importance of using PPE. This can prevent neglect due to a false sense of security. In addition, facilities such as proper rest rooms and the establishment of a work culture that upholds safety also have the potential to increase workers' compliance with OHS.

From a theoretical perspective, the results of this study expand insights into the factors that influence compliance behavior towards PPE use. It not only includes knowledge and cognitive aspects, but also involves psychosocial elements such as comfort and work experience, which contribute to shaping safe work habits. This research can be used as a basis for formulating behavior-based intervention strategies to improve the implementation of work safety in the industrial sector.

## CONCLUSION

There is a significant relationship between:

- a. Length of service with PPE compliance.
- b. PPE comfort with compliance with PPE use.

## RECOMMENDATIONS

- a. Companies need to conduct regular evaluations of the design and quality of PPE.
- b. Conduct periodic education and training regarding the importance of using PPE.
- c. Increase supervision of the use of PPE consistently and unknown by workers.
- d. Implement a reward and punishment system in the use of PPE.
- e. For further research using a longitudinal design, so that it can evaluate changes in PPE compliance behavior over a period of time. With this approach, researchers can see the consistency of compliance as well as the ongoing influence of tenure and PPE comfort on worker behavior over time.

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