

ANALYSIS OF THE EFFECT OF COMPLIANCE WITH THE USE OF PERSONAL PROTECTIVE EQUIPMENT ON WORKPLACE ACCIDENT RATES IN THE CONSTRUCTION INDUSTRY

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Abstrak

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The construction industry is one of the sectors with a high risk of work accidents. One important effort in preventing work accidents is compliance in the use of Personal Protective Equipment (PPE). This study aims to analyze the effect of compliance in the use of PPE on the number of work accidents through literature studies from various national journals. The results of the study show that workers who comply with using PPE have a much lower risk of work accidents than workers who do not comply. The level of compliance is influenced by factors such as knowledge, attitude, length of service, comfort of PPE, and support and supervision from management. Therefore, increasing work safety training, providing adequate PPE, and strengthening a safety culture are essential to create a safe and healthy construction work environment.

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INTRODUCTION

The construction sector is one of the industries that makes a major contribution to infrastructure development and national economic growth. However, behind this contribution, this industry also has a high risk of work accidents. Data from the International Labor Organization states that construction workers contribute almost 20% of all fatal work accidents in the world (Dollard & Neser, 2019) . In Indonesia, according to a report from the Ministry of Manpower, the construction sector is in the top three in the number of work accident cases, both minor and fatal. (Yuli et al., 2022)

Work accidents in the construction sector can be caused by various factors, including dangerous work environment conditions, human error, weak monitoring systems, and low compliance with work safety procedures. One of the fundamental aspects of the Occupational Safety and Health (K3) system is the use of Personal Protective Equipment (PPE), which is the last form of protection against the risk of work accidents after risk elimination and control



efforts have been carried out.

According to the Regulation of the Minister of Manpower and Transmigration No. 8 of 2010, PPE is defined as a tool that has the ability to protect a person from the risk of accidents or occupational diseases. Types of PPE in construction include safety helmets, gloves, eye protection, safety shoes, and hearing protection. However, the effectiveness of PPE is largely determined by the level of worker compliance in using it properly and consistently . (Fenelia & Herbawani, 2022)

The theoretical basis used in this study is the Health Belief Model (HBM) Theory, which explains that a person's behavior in maintaining their health including the use of PPE is influenced by perceptions of risk vulnerability, perceptions of severity of consequences, benefits of use, perceived barriers, and cues to act. In the construction context, workers who are aware of the high risk of injury and believe that the use of PPE can prevent negative impacts tend to comply with its use. (Rachmawati et al., 2022)

Previous studies have shown that the level of compliance with the use of PPE is significantly correlated with the number of work accidents. A study (Piri et al., 2012) in Tomohon City stated that consistent use of PPE can reduce the risk of accidents by up to 40%. Similar findings were reported by (Nataya & Saputra, 2025) who found a significant relationship between compliance with helmet use and a decrease in head injuries ($p = 0.011$). However, there are still many cases where workers do not use PPE for reasons of comfort, limited availability, or lack of supervision from project management.

Based on this phenomenon, this study was conducted with the aim of identifying and analyzing the influence of compliance with the use of Personal Protective Equipment on the number of work accidents in the construction industry through a literature study approach. This study will collect and examine the results of previous studies, both national and international, in order to obtain a comprehensive picture of trends, relationship patterns, and factors that influence the level of compliance and its impact on work safety.

With a literature review approach, the results of this study are expected to be a source of information and scientific references for academics, occupational safety practitioners, and policy makers in developing strategies to improve OHS culture, especially in terms of compliance with the use of PPE. In addition, this study is expected to be able to show research gaps that can be followed up in future field research.

RESEARCH METHODS

This study applies a literature review method to examine the effect of compliance with the use of personal protective equipment on the number of work accidents in the construction industry. Data were collected from various journal articles through database sources such as Google Scholar. The search was conducted using keywords such as "the effect of compliance with the use of personal protective equipment", as well as other related terms.

RESULTS AND DISCUSSION

Table 1. Results and Discussion

No	Writer		Title	Results
1.	Nurala Andriyani, Prosecutor	Rahma, Suherman	The Influence of Compliance with the Use of Personal Protective Equipment (PPE) on the Level of Work Accidents in the Construction and Industrial Sectors	Research in the construction and industrial sectors shows that success in reducing the number of work accidents is greatly influenced by worker compliance in using Personal Protective Equipment (PPE), as evidenced by routine training and strict internal supervision in several companies. However, the implementation of occupational safety still faces a number of



			obstacles, such as low levels of compliance due to discomfort in using PPE, lack of availability of proper PPE, and weak supervision from management. In addition, several important aspects in the implementation of occupational safety, such as safety education, supportive work culture, and incentive and sanction systems, have not been fully implemented optimally in the work environment.
2.	Lidia Sarah Fairyo, Anik Setyo Wahyuningsih	Compliance with the use of personal protective equipment by project workers	Research on the construction project of PT X Semarang shows that the level of compliance in the use of personal protective equipment (PPE) among iron assembler workers greatly affects the number of work accidents. Although the company has provided PPE and implemented K3 programs such as safety induction, toolbox meetings, and safety patrols, most workers still do not use PPE while working. This is supported by data that out of 50 iron assembler workers, 84% do not use PPE. Negative attitudes, low levels of education, and short work periods are the main factors associated with low compliance. The results of statistical tests show that there is a significant relationship between attitude ($p = 0.001$), level of education ($p = 0.001$), and length of service ($p = 0.001$) with compliance with the use of PPE. However, no significant relationship was found between the level of knowledge and compliance ($p = 0.653$), indicating that knowledge alone is not enough without being accompanied by awareness and positive attitudes. Therefore, increasing worker awareness and motivation is very important in efforts to prevent work accidents in the construction sector.
3.	Ramayanti Boru Simanjuntak, Ratna Sari Putri Br Tarigan, Tety Junita Purba, Alprindo Sembiring	Analysis of Factors Related to Compliance with the Use of Personal Protective Equipment in Spraying Unit Workers at PT PAJ in 2023	Discussion: Research at PT PAJ shows that the level of compliance with the use of personal protective equipment (PPE) is greatly influenced by length of service, knowledge, worker attitudes, and encouragement from leaders. This is proven through logistic regression analysis which shows that workers with a length of service of more than one year have a 13.47 times greater chance of compliance compared to new workers. However, the implementation of the use of PPE in the

PT PAJ spraying unit still experiences obstacles, such as low levels of knowledge among some workers, less positive attitudes towards the importance of PPE, and lack of support and supervision from leaders. Meanwhile, several factors such as age, gender, education level, availability of PPE, and encouragement from coworkers do not show a significant effect on compliance. Thus, efforts to increase compliance need to be focused on strengthening training, fostering attitudes, and optimizing the role of leaders in creating a safe work culture that complies with K3 standards

4. Kartika Dyah Sertiya Putri, Yustinus Denny AW
Analysis of Factors Related to Compliance in Using Personal Protective Equipment
Research in the construction industry shows that the level of compliance with the use of Personal Protective Equipment (PPE) has a significant impact on the number of work accidents. A study conducted on a building construction project in the Surabaya area revealed that workers who did not comply with the use of PPE were more susceptible to work accidents, ranging from minor injuries to serious injuries. Although most workers have been given safety training, the level of compliance is still low, due to comfort factors, work habits, and weak supervision from management. In addition, the availability of inadequate PPE and the absence of strict sanctions also worsen the level of compliance. The results of the analysis show that the higher the compliance with the use of PPE, the lower the number of work accidents that occur. Therefore, it is necessary to strengthen work safety policies, increase supervision, and provide adequate PPE in order to create a safe and productive work environment in the construction sector.
5. Esti Nur Fadila, Triana Srisantyorini
Analysis of the Influence of the Use of Personal Protective Equipment (PPE) on the Level of Work Accidents from the Perspective of Occupational Safety and Health (K3)
Research in the construction industry sector shows that compliance with the use of Personal Protective Equipment (PPE) has a significant effect on the number of work accidents. A study conducted by Esti in the construction project of Tower II Building, Sidoarjo Hospital, found that many workers still did not use PPE according to standards, such as helmets, gloves, and safety shoes. The results of the observation showed that low levels of

compliance resulted in a high risk of minor to serious work accidents. Factors that influence low compliance include discomfort when using PPE, lack of knowledge about the importance of work safety, and weak supervision from project management. These findings indicate that the higher the level of compliance in the use of PPE, the lower the number of work accidents that occur in the field. Therefore, increasing worker compliance through regular training, providing adequate PPE, and implementing sanctions for violations are important steps to create a safer construction work environment.

Based on a review of the five journals above that discuss the influence of compliance with the use of Personal Protective Equipment (PPE) on the number of work accidents in the construction sector, there are several important points discussed, including:

1. **Compliance with the Use of PPE as a Key Factor in Accident Prevention**
All journals conclude that the level of worker compliance in using PPE greatly determines the number of work accidents that occur. Studies in the construction projects of Sidoarjo Regional Hospital, PT PAJ, and PT X Semarang showed that workers who did not use PPE had a much higher risk of work accidents compared to workers who were compliant.
2. **The Role of Worker Knowledge and Attitudes**
The level of knowledge about occupational safety and attitudes towards the importance of using PPE are the main factors influencing compliance. Workers with good knowledge and positive attitudes towards occupational safety are more likely to comply with using PPE. (Rahma & Jaksa, 2025) .
3. **Effect of Work Period and Experience**
Workers with longer working periods or sufficient work experience have been shown to have higher levels of compliance in the use of PPE. Journals from PT PAJ and PT X Semarang emphasize that workers who are accustomed to the construction work environment are more aware of the risk of accidents and are more disciplined in using PPE.
4. **Availability and Comfort of PPE**
The availability of complete PPE and comfort in use are also supporting factors for compliance. Several studies have shown that PPE that is uncomfortable or not available in sufficient quantities causes workers to be reluctant to use it. This is a real obstacle in the implementation of the K3 program.
5. **Role of Management Supervision and Support**
Consistent supervision and support from project leaders greatly influence worker compliance with PPE use. Without supervision and role models from superiors, most workers tend to ignore work safety procedures. A study at PT PAJ confirmed that encouragement from leaders significantly increased compliance.
6. **Obstacles Faced in the Field**
Some of the obstacles found in the implementation of the use of PPE include the lack of education and socialization of safety, the minimal availability of quality PPE, and the absence of strict sanctions for violators. In addition, a work culture that trivializes safety is also a challenge in itself.

7. Suggestions and Recommendations

All studies suggest the need for regular occupational safety training, procurement of quality and comfortable PPE, and strengthening the role of management in monitoring and implementing sanctions. A work culture that upholds safety also needs to be built through an educational approach and role models from leaders.

From these five journals, it can be concluded that the success of preventing work accidents in the construction industry is greatly influenced by compliance with the use of PPE, which is influenced by knowledge, attitude, work experience, as well as management support and availability of facilities. There needs to be a commitment from all project parties to create a safe and low-risk work environment.

CONCLUSION

Worker compliance in using Personal Protective Equipment (PPE) has been proven to have a significant impact on reducing the number of work accidents in the construction sector. Workers who comply with wearing PPE such as helmets, safety shoes, and gloves tend to be safer and avoid accidents, both minor and serious. This level of compliance is influenced by several factors, such as knowledge about safety, attitudes towards PPE, length of work experience, as well as support from management and the availability of comfortable PPE. Unfortunately, there are still many workers who ignore it because PPE is considered uncomfortable, lack of education, and weak supervision. Therefore, regular training, provision of proper PPE, strict supervision, and a work culture that prioritizes safety are essential to create a safe and low-risk work environment.

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