

Knowledge And Attitude Factors As Determinants Of Compliance With The Use Of PPE In Construction Workers: An Empirical Study

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ABSTRACT

Accidents in the construction industry are among the largest compared to other industries, largely due to non-compliance with the use of personal protective equipment (PPE). This study seeks to examine aspects of knowledge and attitudes that affect compliance with the use of personal protective equipment among construction workers. The methodology used is quantitative, utilizing analytical survey techniques. Samples are deliberately collected from personnel involved in specific building projects. Data were collected using a structured questionnaire and processed through chi-square statistical tests and logistic regression. The results showed a substantial correlation between workers' knowledge and attitudes and their adherence to PPE use. Employees who have extensive knowledge and a favorable attitude are often more compliant in utilizing personal protective equipment than those with limited information and detrimental attitudes. As a result, increasing knowledge and fostering a positive attitude through occupational safety training is essential to increase compliance with the use of personal protective equipment (PPE).

Keywords: *Knowledge, Attitude, Compliance, Personal Protective Equipment, Construction Workers*

INTRODUCTION

Occupational health and safety is an important thing that protects personnel in various institutions, companies and projects. Co-workers, your own safety, and everyone in the work environment. By controlling hazards and meeting safety standards, it is hoped that the environment will be safe. Equipment, and chemicals in production, are developing rapidly in certain sectors. Problems related to occupational health and safety, despite these advances in productivity and manpower. This includes increased workplace hazards and the high risk of accidents, which can lead to and loss of life (Aini et al., n.d.).

Accidents are still a serious issue in the world of employment, especially in the construction sector which has a high risk to occupational safety and health. Data from the International Labour Organization (ILO) states that every year there are more than 430 million work accidents worldwide, with a death rate of 2.78 million people. In Indonesia itself, BP Jamsostek data in 2022 shows a significant increase in the number of work accident cases, from 210,789 cases in 2019 to 234,370 cases in 2021 This high figure shows the need to implement Occupational Safety and Health (K3), especially in the use of Personal

Protective Equipment (PPE) (Umur, 2025). The use of PPE is the last important in protecting personnel from exposure to direct hazards in the workplace of the risk control hierarchy system (Aini et al., n.d.).

However, in the field there are still many who do not comply with the PPE rules, even though they have understood. Yulianti et al. (2024) on furniture industry workers showed that 91.6% of respondents had good knowledge of PPE, but only 38.3% showed a positive attitude with a negative attitude (Yulianti, 2024). This is with the findings of Putri and Yermi (2025) which confirm that although knowledge plays an important role, attitude also emphasizes compliance with PPE (Umur, 2025). With a p value of 0.008, research by Apriyanti and Suwandi (2023) shows that knowledge and compliance with the use of personal protective equipment (PPE) have a relationship that deserves attention. This suggests that a person's likelihood of keeping up with PPE use increases with increasing levels of knowledge (Yulianti, 2024).

While knowledge, attitudes, and adherence to PPE use have been the subject of many previous studies, most have been in the manufacturing or housing sectors. Although construction is a sector with a fairly high risk of work accidents, research

on these elements in the industry is still lacking. Particularly in construction workers, who have different job features, hazards, and work environments than in other sectors, the scientific uniqueness in this paper lies in the analytical attention to the combined influence of knowledge and attitudes on PPE compliance. Examining these elements holistically will help this research to offer fresh ideas and useful suggestions for improving compliance with the use of PPE in the building sector.

Do knowledge and attitude factors significantly affect the level of compliance of construction workers in using personal protective equipment? Thus, the purpose of this study is the influence of knowledge and attitude factors on PPE compliance in construction workers, in order to provide input for K3 in the sector.

METHODS

This study uses a literature review methodology, specifically using research obtained from journal articles to collect a variety of information for research purposes. The database used in this search is Google Scholar online. The temporal range in this material is from 2020 to 2025. This investigation was carried out from April to May 2025. A literature review in this study was conducted to analyze the factors of knowledge and attitudes that affect the compliance with the use of personal protective equipment (PPE) among construction workers. The literature examined by the researcher was then condensed and shown in **Table 1** below. This research has gone through the FKM UMJ ethical review process with the ethical review number 10.089.C/KEPK-FKMUMJ/V/2025.

Table 1. Of List of Literature Used in Research

No	Research Name	Title	Publications and years	Conclusion
1.	Apriyani Aini	THE RELATIONSHIP BETWEEN KNOWLEDGE AND COMPLIANCE WITH THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)	Permas Scientific Journal: STIKES Kendal Scientific Journal Volume 13 Number 2, April 2023	The results showed a correlation between Personal Protective Equipment (PPE) and knowledge compliance. It is anticipated that leaders will increase their understanding of the importance of complying with PPE regulations through comprehensive K3

No	Research Name	Title	Publications and years	Conclusion
				training and specific PPE instructions.
2.	Yerni	INFLUENCE OF AGE, KNOWLEDGE AND ATTITUDES TOWARDS THE USE OF PERSONAL PROTECTIVE EQUIPMENT	Journal of Public Health Dynamics Volume 3, Issue 01 , January 2025	Based on the results of the above research, it can be concluded that knowledge is the most important factor that affects the use of tools by workers. Increase their awareness and compliance periodically to increase awareness and compliance with the use of personal protective equipment.
3.	Diana Rahma Elmaghfuroh	Knowledge and Attitudes About Personal Protective Equipment for Home Industrial Furniture Workers in Krapyakrejo Village, Pasuruan City	Scientific Journal of Nursinge Volume 1 Number 1 March 2024	Based on data and research results conducted in Krapia Kerecho Village, Gading Kerecho District, Pasuruan Municipality, it can be concluded that the level of workers' knowledge of PPE is in the good category while workers' attitudes towards PPE are in the bad category. Through this research, it is hoped that health services will be able to implement the plan.
4.	Pitri Noviadi	DEVELOPMENT OCCUPATIONAL SAFETY AND HEALTH APPLICATIONS CAPEDE (CHECKLIST) PERSONAL PROTECTIVE EQUIPMENT) ANDROID BASED AT	Journal of Environmental Sanitation ISSN 2828 - 7592 Vol.4, No. 2 , November 2024	From the results of this study, it can be concluded that In conclusion, the application of CAPEDE K3 Meets the eligibility category very well Evaluation from K3 experts (88.75%) and experts Media (85%) and Workers (77.12%).

No	Research Name	Title	Publications and years	Conclusion
		WORKERS IN THE RUBBER INDUSTRY OF PALEMBANG CITY		
5.	Agus Aan Ardiansyah	COMPLIANCE WITH THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE) MASKS IS REVIEWED FROM THE KNOWLEDGE AND ATTITUDE OF WORKERS	Ikesma: Journal of Public Health Sciences Vol. 17, No. 1, March 2021	Research shows that about fifty percent of mine workers have adequate knowledge about the use of PPE masks, while the majority show a positive attitude towards their use; however, most workers show suboptimal adherence to the use of PPE masks in the workplace. The results of the analysis showed a significant and strong relationship between knowledge and attitude and compliance of workers with the use of PPE masks in sandstone mines.
6.	Nurul Widi Anggraeni	STUDY OF WORKER BEHAVIOR ON THE USE OF DIAPRON PERSONAL PROTECTIVE EQUIPMENT TAMPA PADANG MAMUJU AIRPORT	volume2Issue 2 June 2021	Employees know less about the use of personal protective equipment (PPE) at the Tampa Padang Mamuju Airport Apron than key and key informants. This is because the main informant does not have a thorough understanding of PPE, especially about its requirements, the type of PPE that must be used in the apron, and the consequences of the absence of PPE.

No	Research Name	Title	Publications and years	Conclusion
7.	Muhammad Rizky Januardhana	APPLICATION OF PERSONAL PROTECTIVE EQUIPMENT TO THE WORKERS OF THE FIRE AND RESCUE SERVICE OF NORTH PENAJAM PASER REGENCY	Safety journal, Occupational health and Environmental Protection- ISSN:2656 1891 Volume 10 No. 1 May 2024	<p>The research conducted from March 29 to April 2, 2023 regarding "The Application of Personal Protective Equipment (PPE) to Workers at the Fire and Rescue Service (DPKP) of North Penajam Paser Regency" using descriptive methods through qualitative approaches such as interviews, observations, and questionnaires produced the following results:</p> <ol style="list-style-type: none"> 1. The PPE requirements for the Fire and Rescue Service have met the eligibility criteria and are completed with proof of a Certificate of Eligibility for Use. 2. The necessary PPE equipment can be accessed and placed at the fire station. Below is a compilation of accessible personal protective equipment (PPE): <ol style="list-style-type: none"> a. Double filter pig funnel gas mask b. Whole/wearpack c. Gloves d. Helmet e. Google Glasses f. Reflective tape g. Seatbelt h. Protective footwear i. Safety harness

No	Research Name	Title	Publications and years	Conclusion
				<p>j. Head protectors, among others.</p> <p>3. The Fire Education and Training Center located on Jl. Raya Ciracas No. 113, Ciracas District, East Jakarta City, held a training.</p> <p>4. PPE maintenance is carried out every three times a week and after the appliance has been used.</p> <p>5. Every three months at the same location, instructions related to the use of PPE are carried out; the final coaching session will take place in North Penajam Paser Regency on February 22, 2022.</p> <p>6. Of the eighteen firefighters employed during the previous year, five had been involved in accidents due to poor use of PPE.</p> <p>7. Based on the findings, some of the more extensive tools that can be accessed are in poor condition because they are ignored by the service.</p> <p>8. From the findings of surveys, observations, and interviews, it was found that there were</p>

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				instruments that were not suitable and the calculations were not in accordance with the current workforce. The specifics of the study revealed that 36% of the data came from surveys, 36% from interviews, and 28% from observations. The two problems found were a mismatch in the number of tools with the individuals on duty and the absence of equipment feasibility.
8.	Anjlya Agustin	Analysis of Compliance Behavior in the Use of Personal Protective Equipment (PPE) On Health Workers During the Covid-19 Pandemic (Systematic Review)	Received [30 August 2022] Revised [29 September 2022] Accepted [3 October 2022]	<p>1. Individual compliance rules for the use of Personal Protective Equipment (PPE) can be affected by the duration of shifts and the workload faced. 2. In addition, age and PPE utilization patterns show different relationships, where work experience often improves with age. 3. The use of PPE is also greatly influenced by unclear and unclear rules. 4. Its execution suffered from a limited supply of PPE.</p> <p>Therefore, by amending relevant laws and regulations, the government must investigate the use of PPE. Hospitals should also train their employees on the safe use of PPE.</p>

No	Research Name	Title	Publications and years	Conclusion
9.	Asyera Br Surbakti	THE EFFECT OF OCCUPATIONAL SAFETY AND HEALTH COUNSELING ON PERSONAL PROTECTIVE EQUIPMENT USAGE BEHAVIOR	JUKEKE Vol2 No. 1 February 2023	<p>The study led to some very significant findings. First, information affects how a person uses personal protective equipment before occupational safety and health counseling at PT. Wijaya Karya Beton Tbk North Sumatra. Second, before counseling, attitudes help explain more use of the instrument. Third, the preoccupation with occupational health and safety counseling reveals a favorable impact on activities.</p> <p>Fourth, knowledge has a big impact on how a person wears PPE in the workplace after receiving counseling. Fifth, action is very important to increase the use of personal protective equipment after counseling. Finally, attitudes have an impact on how a person wears PPE in accordance with occupational health and safety guidelines.</p>
10.	Muhammad Akbar Salcha	COMPLIANCE WITH THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE) ON WORKERS IN SOUTH	Volume 6, Number 2, August 2022	Motivation, education, and knowledge are all highly correlated with PPE compliance among employees of PT. Bujaya Karya Makmur Sorowako.

No	Research Name	Title	Publications and years	Conclusion
		SOROWAKOSULA WESI		
11.	Lany Hakim	Factors related to health worker compliance Using the Tool Personal Protective (APD) In the Pandemic Era Covid 19 at the Makkasau Makassar Health Center Year 2020	VOL. 2, NO. 1, JANUARY -MARCH 2021	This research resulted in a number of important findings. The compliance of health workers to use personal protective equipment (PPE) during the Covid-19 pandemic at the Makkasau Makassar Health Center is significantly correlated with the length of their working day. Second, there is a strong correlation between surveillance and health professional compliance with PPE use in the same setting. In the end, there is a significant correlation between workload and compliance of health workers with the use of PPE at the Makassau Makassar Health Center.
12.	MUALIM	KNOWLEDGE AND ATTITUDES OF THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE) ON ELECTRIC WELDING WORKERS	Volume 9 No. 1 (April 2021)	Awareness of Personal Protective Equipment (PPE) among electrical welding workers is inadequate. Attitudes towards PPE show that the majority of workers do not have adequate support. More than fifty percent of electrical welding personnel do not fully utilize personal

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				protective equipment. There is a substantial correlation between awareness of personal protective equipment (PPE) and its use among electric welding workers in Bengkulu City. A significant correlation was seen between views on PPE and its use in the region.
13.	Adyssya Githa Assyahra	THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE) IN LOADING AND UNLOADING WORKERS AT KENDARI CONTAINER TERMINAL	Window of Public Health Journal, Vol. 5 No. 2 (April, 2024)	<p>Workers' knowledge, attitudes, and behaviors hinder the effective use of Personal Protective Equipment (PPE). Therefore, improving workers' understanding of personal protective equipment is essential. Employees who have not fully utilized it are anticipated to demonstrate greater awareness of the importance of PPE through involvement in Safety Talks. They are required to notify their supervisors if they experience any discomfort or require replacement of damaged PPE, ensuring that all personnel at the Kendari Container Terminal use PPE appropriately.</p> <p>Employees who adhere to PPE usage guidelines should be recognized, as this can incentivize them to consistently adhere to safety protocols. Companies</p>

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				must provide adequate personal protective equipment (PPE) in accordance with regulations and ensure monitoring in all workplaces.
14.	Yuliana Fatmala	Evaluation of the Use of Personal Protective Equipment (PPE) to Improve Occupational Safety in the Chemical Industry	Journal of Nursing and Health (JNH) Volume 8 Number 2 of 2023	Assessing the use of Personal Protective Equipment (PPE) is essential for worker safety in the chemical sector. Personal protective equipment that is often used consists of respiratory masks, protective clothing, gloves, and footwear. This personal protective equipment is necessary because of the presence of harmful substances that endanger the health of workers. Goggles and masks are essential to protect workers' faces from liquids in the workplace.
15.	St. Joseph's Basilica	Practice of Using Personal Protective Equipment (PPE) and Student Occupational Safety at the Nursing Laboratory, Tanjungpinang Polytechnic	Vol.2, No.2, November 2022	Responses were mostly made up of girls aged 17 to 20. The nursing students of the class of 2021 have extensive knowledge; Despite this, the majority showed a negative attitude. They use Personal Protective Equipment (PPE) for safety; However, the main reason for non-compliance is time restrictions, which are the most commonly reported justifications.

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16.	Rafindadi, Aminu Darda'u; Napiah, Madzlan; Othman, Idris; Alarifi, Hamzh; Moses, Usman; Muhammad, Moses	Significant Factors That Influence the Use and Non-Use of Personal Protective Equipment (PPE) on Construction Sites-Supervisors' Perspective	Ain Shams Engineering Journal, Volume 13, Issue 3, May 2022	This study investigates the critical elements affecting the utilisation and non-compliance of personal protective equipment on construction sites from the supervisors' perspective. The findings indicated that risk perception of hazardous conditions, safety training, on-site safety supervision, and job position strongly forecasted the extent of PPE use. Risk perception and safety training diminish the probability of non-compliance, whereas supervision and work position enhance adherence to PPE usage. Understanding hazards and safety training are essential elements in enhancing worker adherence to PPE usage in the construction industry.
17.	Fadilatus Sukma Ika Noviarmita and Lanobyan Hamengku Prananya	"Knowledge and Attitudes Workers Toward Compliance Use Personal Protective Equipment	The Indonesian Journal of Occupational Safety and Health, Volume 12, Issue 3, 2023	This research revealed that most workers had a positive attitude and comprehension concerning Personal protective equipment (PPE) usage, along with high compliance in its usage. The degree of adherence to PPE usage does not consistently correspond with an individual's age or educational attainment. Understanding and

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				attitude toward compliance with the use of personal protective equipment (PPE) are correlated. Employees possessing substantial knowledge are 6.2 times more likely to follow PPE usage compared to those who lack understanding. Attitude has a big impact on compliance behavior when it comes to wearing personal protective equipment (PPE). Formal education does not ensure workers' adherence to PPE usage; but, sound knowledge and positive attitude substantially impact such adherence.

RESULTS AND DISCUSSION

"Personal Protective Equipment, or PPE, is a tool used to protect oneself. Its main function is to isolate the body from the various dangers that exist in the workplace." (Fatmala, 2023). "Personal Protective Equipment (PPE) is intended to prevent accidents in the workplace that are in accordance with the specific nature of the work being done. However, unforeseen circumstances can sometimes jeopardize staff safety. This is regulated by the Regulation of the Minister of Manpower

and Transmigration of the Republic of Indonesia Number PER. 08/MEN/VII/2010 concerning Personal Protective Equipment." (Fatmala, 2023).

The difference in the use of personal protective equipment (PPE) between female and male students was not statistically significant. This omission arose from the failure of the researcher to conduct a comparative analysis between male and female students on the parameters that affect the use of PPE in the laboratory. The head of the nursing laboratory sub-unit has

indicated that the provision of PPE in the nursing laboratory is sufficient to meet the needs of students during practical sessions. Laboratories provide various forms of personal protective equipment (PPE), including clean gloves, sterile gloves, one needle per student, medical waste bins, non-medical waste bins, gowns, safety shoes, fire extinguishers (APAR), safety boxes, hand sanitizers, glasses, laboratory slippers, and helmets. In addition, students must provide personal protective equipment separately, including masks and lab slippers (Silalahi, 2022).

Research (Darda'u Rafindadi et al., 2022) shows that knowledge and attitudes greatly affect construction workers' compliance with the use of personal protective equipment (PPE). Safety training has shown that increased compliance with PPE on construction sites is a direct effect of the knowledge gained. Individuals who have received safety training are more likely to comply with the use of PPE due to their better understanding of workplace hazards and proficiency in proper utilization. In addition, accurate perception of danger in hazardous situations encourages personnel to use personal protective equipment with higher discipline. Conversely, misunderstandings or lack of awareness of the dangers can

reduce compliance levels. Field supervision affects worker attitudes, as consistent supervision from supervisors significantly improves compliance with PPE use.

CONCLUSION

The results showed that about fifty percent of mine workers had sufficient information regarding the use of PPE masks, the majority showed a good attitude towards them, although most showed inadequate compliance with PPE mask standards in the workplace. The findings of this study show a significant and strong relationship between knowledge and attitude and compliance of workers in the use of PPE masks in sandstone mines. Increased understanding and attitudes among employees are related to increased compliance in the use of PPE masks in the workplace (Ardiansyah, Maret 2021).

The relationship between understanding and compliance with the use of Personal Protective Equipment (PPE) among employees. Leaders are expected to increase their understanding of the importance of information for production workers about PPE compliance, through general K3 training and targeted instruction on PPE (Aini, April 2023).

Use of Personal Protective Equipment (PPE) Improving work safety in the chemical industry is paramount. The

utilization of personal protective equipment (PPE), including respiratory masks, protective clothing, gloves, and footwear, is critical in this domain. These personal protective equipment protect workers from exposure to harmful chemicals that can harm their health. Additionally, goggles and masks are essential to protect workers' faces from possible liquid splashes at work (Fatmala, 2023).

Compliance in the use of PPE in the chemical industry work environment correlates a lot with workers' knowledge and attitudes. While most employees have a decent level of knowledge and attitude, some non-compliant workers use PPE implying that good knowledge and attitudes are not always followed by obedient behavior if it is not accompanied by efficient implementation in the field (Noviarmi & Prananya, 2023).

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