



## The Correlation between Knowledge and Compliance with Personal Protective Equipment (PPE) Use in Construction Workers at EMC Alam Sutera Hospital, South Tangerang City

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### A B S T R A C T

Construction work has a high-risk workplace. Construction workers are often faced with difficult and dangerous working situations. One of the efforts to protect workers in Occupational Safety and Health (OSH) is by supplying Personal Protective Equipment (PPE). This study analyzes the correlation between knowledge and compliance with personal protective equipment (PPE) used in construction workers. This paper correlated quantitative research with a cross-sectional approach. The study population was all construction workers at EMC Alam Sutera Hospital, South Tangerang, totaling 70 people. There were 70 respondents with a total sampling technique. The instruments were PPE compliance observation sheets and PPE knowledge questionnaires. Data analysis was univariate and bivariate analysis. Results showed that most respondents were 40 or older (60%). In addition, half of them had secondary and tertiary education (54.3%). Most also had good knowledge about PPE (65.7%). Of the 46 construction workers with good PPE knowledge, 42 complied with PPE use (91.3), and only four were not compliant (8.7%). Meanwhile, of the 24 construction workers with poor knowledge of PPE, 11 were not compliant with PPE use (45.8%), and 13 were compliant (54.3%). The statistical test results obtained were  $p=0.001$ . Thus, there was a significant correlation between knowledge and compliance with PPE use in respondents. In conclusion, knowledge correlates compliance with PPE uses among construction workers in EMC Alam Sutera Hospital, South Tangerang City. The hospital should provide recommendations to construction companies at EMC Alam Sutera Hospital, South Tangerang City, regarding using full PPE for construction workers.

## INTRODUCTION

The implementation of Occupational Health and Safety (OHS) is one form of effort to create a workplace that is safe, healthy, and free from environmental hazards to prevent work accidents and occupational diseases. Thus, OHS can increase work efficiency and productivity (Diana, 2016). Data from the International Labor Organization (ILO) in 2018 reported that every year, there were 250 million cases of work accidents and 160 million cases of workers getting sick due to workplace hazards, and more than one person died due to illness and accidents at work (ILO, 2018). In Indonesia, referring to data from the Social Security Agency for Employment (here and after called *BPJS Ketenagakerjaan*), it was noted that cases of work accidents continued to increase, from 114,000 cases in 2019 to 177,000 in 2020. The number was based on the data of claims of workers who had work accidents, meaning that the actual number of work accidents was more significant because not all workers were participants of *BPJS Ketenagakerjaan* (BPJS Ketenagakerjaan, 2021).

According to the Occupational Safety and Health Administration (OSHA), Banten Province in 2018 ranked first in the most significant number of cases of work-related accidents. There were increased work-

related accidents in Banten Province, from 1,483 in 2017 to 1,539 in 2018. Most cases of work accidents in Banten Province occurred in the industrial sector. Most work accidents are due to insufficient OHS understanding and awareness among workers and companies (Disnakertrans Provinsi Banten, 2019).

Work in the construction sector is still a goal for many job seekers. Construction involves building design, material procurement, and construction implementation. Construction work is labour-intensive, and this work is carried out manually and also using machines. This construction work has a high-risk workplace where workers often face difficult and dangerous working situations and conditions. Therefore, safe work behaviour is essential for construction workers (Tarwaka, 2017).

One of the efforts to protect workers in Occupational Safety and Health (OSH) is by supplying Personal Protective Equipment (PPE). Providing PPE to the workforce is the last resort if engineering efforts and safe work practices have been maximized (Vadlin, 2019). PPE is crucial, especially in work environments with potential occupational health and safety hazards, such as construction. Companies are required to provide PPE as mandated in the Regulation of the Minister of Manpower Number 08/MEN/VII/2010, which states in Article 2 Paragraph 3 that "PPE, as referred to in paragraph (1), must be provided by employers free of charge" (Kemenakertrans RI, 2010).

However, the importance of PPE for personal safety does not make all workers wear it while working. A study by Mariana (2018) found that the number of workers who did not use PPE while working is based on several factors, including the lack of company policies and supervision and aspects of the workers themselves. The study showed workers were reluctant to use PPE because it was uncomfortable. The second reason was that workers felt they did not need PPE because they had many years of work experience and never had a work accident. The third reason was that the PPE looked unattractive and did not fit well. Another reason was ignorance, or they did not know that the PPE must be used.

Astiningsih's research (2018) on construction workers in the Ahmad Yani Semarang Airport Parking Building Development found that the level of non-compliance with the use of PPE in construction workers was still high, reaching 54%. In addition, the results of Rahmawati's research (2022) on workers at PT Abadi Prima Intikarya The Canary Apartment Project in Tangerang City found that 47.1% of workers were not compliant with using PPE. The study also stated that one of the factors influencing workers' non-compliance in using PPE is the lack of workers' knowledge about PPE.

Knowledge involves awareness or understanding gained through experience and learning. Cahyani's research (2020) found that knowledge affected compliance with PPE. In addition, a study by Hakim and Febriyanto (2020) showed a positive and significant correlation between knowledge and compliance with PPE in workers at the Samarinda Shipyard. Furthermore, an investigation by Saliha, Joseph and Kalesaran (2018) stated that the knowledge of Manado - Bitung Toll Road workers correlated with their compliance

with PPE. Thus, the better the knowledge, the better the workers' compliance in using PPE to reduce the risk of work accidents.

EMC Alam Sutera Hospital is one of the private hospitals in the South Tangerang City area, where the authors are the nurses. EMC Hospital renovates and constructs to improve hospital service facilities. A preliminary study showed that several construction workers did not use full PPE, especially PPE that was considered trivial, such as masks and helmets. Dust can harm construction workers because it can cause respiratory problems such as Acute Respiratory Infection (ARI). In addition, not using a helmet also increases the risk of head injury due to falling objects or building equipment. From the interviews with ten workers about the reasons for not wearing PPE, six workers did not wear PPE because they felt that PPE was uncomfortable to wear, and two workers reasoned that they forgot to use PPE. Two workers felt that no accidents would occur by not using PPE because they were used to their work. This study analyzes the correlation between knowledge and compliance with personal protective equipment (PPE) use in construction workers.

## METHOD

This paper was correlational quantitative research with a cross-sectional approach. The study population was all construction workers at EMC Alam Sutera Hospital, South Tangerang, totalling 70 people. There were 70 respondents with a total sampling technique. The instruments were PPE compliance observation sheets and PPE knowledge questionnaires. Data analysis was univariate and bivariate analysis. This research has been approved by the Ethics Commission of YATSI Madani University with the ethical code 022/LPPM-UYM/XII/2022.

## RESULT

Table 1 indicates that of 70 construction workers at EMC Alam Sutera Hospital, South Tangerang City, most are 40 or older (60%). In addition, half of them have secondary and tertiary education (54.3%).

Table 1. The Characteristics of Respondents by Age and Educational Levels

Characteristics	Frequency (n)	Percentage (%)
Age		
< 40 years old	28	40
≥ 40 years old	42	60
Educational Levels		
Primary education (Elementary School - Junior High School)	32	45.7
Secondary and tertiary education (High School and college)	38	54.3
Total	70	100

Table 2 shows that out of 70 construction workers at EMC Alam Sutera Hospital, South Tangerang City, were most compliant with PPE use (78.6%).

**Table 2. Compliance with Personal Protective Equipment (PPE) Use in Construction Workers**

PPE Compliance	Frequency (n)	Percentage (%)
non-compliant	15	21.4
compliant	55	78.6
Total	70	100

Table 3 shows that out of 70 construction workers at EMC Alam Sutera Hospital, South Tangerang City, most have good knowledge about PPE (65.7%).

**Table 3. PPE Knowledge in Construction Workers**

PPE Knowledge	Frequency (n)	Percentage (%)
Poor	24	34.3
Good	46	65.7
Total	70	100

Table 4 explains that of the 46 construction workers with good PPE knowledge, 42 comply with PPE use (91.3), and only four are not compliant (8.7%). Meanwhile, of the 24 construction workers with poor knowledge of PPE, 11 are not compliant with PPE use (45.8%), and 13 are compliant (54.3%).

**Table 4. The Correlation between PPE Knowledge and Compliance in Construction Workers**

PPE Knowledge	PPE Compliance				Total	<i>p</i>	OR	
	non-compliant		compliant					
	N	%	N	%				
Poor	11	45.8	13	54.3	24	100	0.001	8.885
Good	4	8.7	42	91.3	46	100		
Total	15	21.4	55	78.6	70	100		

The statistical test results obtained  $p=0.001$ . Thus, there was a significant correlation between knowledge and compliance with PPE use in construction workers at EMC Alam Sutera Hospital, South Tangerang City, in 2022. The analysis results also obtained an OR (Odd Ratio) value = 8.885. It indicates that workers with poor knowledge about PPE were at risk 8.885 times more for not complying with using PPE than workers with good knowledge.

## DISCUSSION

The results showed that most construction workers at EMC Alam Sutera Hospital in South Tangerang City were 40 or older (60%). Thus, they were adults who should have worked long enough and had sufficient experience in construction. Hurlock states that age describes the experience in individuals. Older individuals will be more mature in thinking and working. In this study, the age was differentiated according to Hurlock (2017). The age criteria are divided into two based on their developmental tasks: 20-40 years (young adults) and 41-60 years (middle adults). Workers aged  $\geq 40$  years (middle adulthood) should have more experience than workers aged  $< 40$  years (young adulthood) because middle adulthood

workers are considered to have worked longer. According to Notoatmodjo (2018b), a person's age will affect a person's absorption and mindset toward the information provided. The older the age, the more a person's attention span and mindset develop. Potter and Perry (2015) also stated that critical thinking skills increase regularly during adulthood.

In addition, half of the respondents had secondary and tertiary education (54.3%). Nursalam (2011) states that the higher a person's level of education, the easier it is to receive information, so the more knowledge they have. Sufficient education will make it easier for a worker to receive information from various sources and do his job more effectively and efficiently. Meanwhile, a lack of education will hinder the development of a person's attitude toward newly introduced values. The prior research by Syekura and Febriyanto (2021) on shipyard workers in Samarinda showed that education levels were associated with PPE compliance. Education is a process of self-development in individuals that is carried out consciously and responsibly to improve knowledge, skills, attitudes, and values to adapt to their environment.

Furthermore, most construction workers at EMC Alam Sutera Hospital, South Tangerang City, were compliant in using personal protective equipment (PPE) (78.6%). It indicated that most construction workers realize that PPE is essential. Construction work is a job with a high risk of work accidents, so workers must be able to protect themselves from the threat of work accidents. Ammad *et al.* (2021) states that using PPE is critical, especially in work environments with potential occupational health and safety hazards, such as construction. Several factors that make workers complain in using PPE include, among others, having good PPE knowledge. Good PPE knowledge can raise awareness about the importance of using personal protective equipment (PPE) for their safety. Workers also know that the potential for accidents in their field of work is high, so their vigilance is also high. Thus, workers have good personal protective equipment (PPE) use behavior.

However, 21.4% of construction workers were not compliant in using PPE. This condition should be avoided because it will endanger workers. By not complying with PPE while working, workers are at high risk of serious injury in the event of a work accident. This study's results align with the previous research by (Hakim and Febriyanto, 2020). The research found that 22.5% of shipyard workers of PT Anugrah Wijaya Berjaya Samarinda were not compliant with using PPE. In addition, an investigation by Cahyani (2020) on PT PLN Persero Surabaya workers found that 24.4% of workers did not comply with using PPE. Saliha (2018) stated several factors could cause non-compliance with using PPE in workers. The factors were low PPE knowledge, forgetting or rushing, lack of PPE provided by the company, and discomfort. Other factors were workers feeling they had work experience and had never experienced a work accident, so they thought they did not need PPE.

Knowledge in this study was everything that construction workers know about PPE to prevent work accidents. The results showed that most construction workers at EMC Alam Sutera Hospital, South Tangerang City, had good PPE knowledge (65.7%). It indicated that construction workers realized using PPE is necessary to protect themselves from work accidents. Thus, improving the knowledge of workers is vital. Notoatmodjo (2018) states that knowledge dramatically influences a person's behavior, in this case, using PPE when working to protect themselves from work accidents. Knowledge plays a vital role in thinking and taking the right action.

However, 34.3% of construction workers had poor PPE knowledge. Poor PPE knowledge makes workers ignorant of using PPE while working, which can endanger them. Many factors can cause a lack of knowledge about PPE, including low educational levels and lack of exposure to sources of information such as print and electronic media. Notoatmodjo (2018b) states that knowledge can be obtained through formal and non-formal education, experience, and mass media. Previous research by Rahmawati (2022) on construction workers at PT Abadi Prima Intikarya also showed that 47.1% of workers had poor knowledge about PPE. In addition, a study by Hakim and Febriyanto (2020) found that 27.5% of shipyard workers of PT Anugrah Wijaya Berjaya Samarinda lacked knowledge about PPE. Good PPE knowledge is an effort to protect workers from work accidents. Workers must understand that every job has a risk of work accidents. With adequate knowledge, they will tend to use PPE when working. They know that using PPE can prevent them from fatal injuries in the event of a work accident (Cahyani, 2020).

The results showed that construction workers with poor PPE knowledge were more non-compliant in using PPE than those with good PPE knowledge. Meanwhile, respondents with good knowledge were more compliant with PPE use. In addition, the statistical test results obtained  $p=0.001$ , so statistically, there was a significant correlation between knowledge and compliance with PPE use in construction workers at EMC Alam Sutera Hospital, South Tangerang City. The statistical analysis also showed that workers with poor PPE knowledge were at risk 8.885 times more for not complying with using PPE than workers with good knowledge. Notoatmodjo (2018a) states that knowledge is vital to forming a person's actions or behavior. With good knowledge, a person can decide something appropriately. In this study, construction workers with good knowledge about the benefits of PPE to protect against severe injuries due to work accidents tend to be obedient in using PPE.

This study's results align with Rahmawati's research (2022) on construction workers at PT Abadi Prima Intikarya. That research showed an association between knowledge and compliance with PPE use ( $p=0.001$ ). In addition, Tri Cahyani and Widati (2021) found a correlation between knowledge and compliance with the use of PPE in PT PLN Surabaya workers ( $p=0.044$ ). The results of Hakim and Febriyanto (2020) also showed a significant relationship between knowledge and compliance with the use

of PPE in workers at the Samarinda Shipyard. Furthermore, an investigation by Saliha, Joseph and Kalesaran (2018) revealed that the knowledge of Manado - Bitung Toll Road workers correlated with their compliance with using PPE. Knowledge is the basis for people to take action against something. A person's behaviour is based on their knowledge. The better the knowledge, the better the workers' compliance in using PPE to reduce the risk of work accidents.

However, some construction workers with good knowledge did not comply with using PPE. It could be because of forgetting or rushing, lack of PPE provided by the company, or PPE discomfort when used. Other factors could be caused by workers feeling that they have work experience and have never experienced a work accident, so they think they don't need PPE (Saliha, Joseph and Kalesaran, 2018).

## CONCLUSION

Knowledge correlates compliance with PPE use among construction workers in EMC Alam Sutera Hospital, South Tangerang City. The hospital should provide recommendations to construction companies at EMC Alam Sutera Hospital, South Tangerang City, regarding using full PPE for construction workers.

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