

Correlation Between Age, Work Period, Knowledge, and Attitude's Workers With Behavior on The Use of PPE

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ABSTRACT

PG. Poerwodadie is one of the white crystal sugar factories left by the Dutch East Indies. In the production process with a fairly high risk of work accidents, the company provides Personal Protective Equipment (PPE). However, most workers have not complied with the use of PPE in the work area. Therefore, it is necessary to research factors related to non-compliance with the use of PPE. The purpose of the study was to determine the relationship between age, years of service, education, and attitudes with workers who were not obedient in using PPE. This research uses quantitative with the cross-sectional approach. The population in this study were all workers at the PG. Poerwodadie manufacturing station totals 80 people. The study concludes that there was a relationship between the age of workers and non-compliance with the use of PPE with the value of Phi and Cramer's V = 0.337. There was a relationship between the working period and non-compliance with the use of PPE with a value of 0.329. There was a relationship between worker knowledge and non-compliance with the use of PPE with the value = 0.279. There was no relationship between worker attitudes and non-compliance with the use of PPE.

Keywords: Age, years of service, education, attitudes, non-compliance with PPE

INTRODUCTION

The Social Security Administration Agency (BPJS) for Manpower state that 147,000 occupational accidents or 40,237 cases per day occur throughout 2018 in Indonesia. About 4,678 cases (3.18%) cause disability and 2,575 cases (1.75%) result in death. Each accident is a loss, which is reflected in the expenses and the accident cost. The costs for accidents are often very high, even though these costs are the burden of a company, society, and country. In 2018, according to the Employment Social Security Administration Agency (BPJS), the cost for occupational accidents was 1.2 Trillion Rupiah. The World Labor Organization (ILO) state that occupational accidents cause a state to lose approximately 4 percent of the Gross Domestic Product (GDP) or US\$ 1,251,353 million due to financing work-related injuries, deaths, and illnesses¹

According to Heinrich in Luthfil et al. (2016), workplace accidents do not just happen. They are caused. Two things that cause workplace accidents are unsafe conditions and unsafe actions of workers. Unsafe actions are related to human factors in K3 culture or actions taken by someone where these actions can endanger themselves, others, equipment, and the environment around them. Meanwhile, unsafe conditions are deviations from the standards that are complied with to avoid accidents in the workplace (Luthfil et al., 2016) 3% of a workplace accident is due to unavoidable things (such as natural disasters), 24% is due to unstandardized environment or equipment, and 73% is due to unsafe behavior.^{2,3}

Prevention of workplace accidents is needed, including securing workplaces, machines, equipment, and work environments. However, the risk of accidents is still not fully controlled after such prevention, so personal protective equipment is used. PPE is the last alternative of the completeness of all technical efforts to prevent accidents.⁴

According to data throughout 2018, it was found that the number of companies that violated K3 norms tended to increase by 21,613 companies. Violations of occupational health and safety norms that are often found in the workplace are non-compliance with work or operating procedures, such as not using personal protective equipment properly when repairing moving equipment or not following predetermined work procedures.⁵

Compliance is a form of behavior that can be influenced by internal and external factors. The use of Personal Protective Equipment according to Geller (2001) includes environmental factors. Thus, compliance with the use of PPE is a specific safety behavior towards the object of the work environment. (6) PPE compliance can reduce the risk of accidents or

occupational diseases, mainly by complying with the company's regulations to reduce workplace accidents. Non-compliance with the use of personal protective equipment significantly affects the incidence of work-related accidents and occupational diseases that will cause five types of losses, including damage, organizational chaos, complaints and grief, abnormalities and disability, death.⁷

A study by Ria Astuti and Zaenab (2019) regarding factors related to the incidence of workplace accidents in PG Bone Arasoe describe the causes of workplace accidents include uncompleted regular health checks, workers with a low level of knowledge (62%), and disobedient of using Personal Protective Equipment (75%).⁸

Research conducted by Yuliani (2017) describes a correlation between attitudes and knowledge of PPE use for partner workers at PT. X.⁹

PG Poerwodadie is one of the sugar factories (PG) that is built in 1832 by the Dutch East Indies and is now managed by "Nederlandsche Handel Maatschappij" (NHM). This place is located in Magetan, East Java. Currently, PG Poerwodadie still operates to produce white crystal sugar under PT Perkebunan Nusantara XI/PTPN XI ownership. PG Poerwodadie mainly still uses heavy machinery and equipment from the Dutch era in the production process, which are quite old and require routine maintenance carried out by workers at the Fabrication Station. With a relatively high risk of work accidents for workers involved in this activity, it is necessary to protect Occupational Safety and Health. To fulfill this aspect, all workers in this project are provided with PPE facilities, including safety helmets, safety shoes, masks, body harnesses, and gloves.

Based on a preliminary study conducted by interviewing the K3 division in the company, most of the workers have not complied with the rules for using Personal Protective Equipment in the work area. Many possibilities trigger the incompliance of workers, including a variation of worker ages, low awareness of using PPE, uncomfortable feeling when using PPE, and punishments for any incompliance of using Personal Protective Equipment to make OSH culture are still challenging for the company. Therefore research on the correlation between age, period of work, education, and attitudes towards unsafe or in compliance behavior in PPE (Personal Protective Equipment) is needed.

METHOD

This research was an analytic observational study using a cross-sectional approach. 80 workers at the PG Poerwodadie manufacturing station were enrolled as the study population. Sample of this study were 80 workers

from the manufacturing workers. The instruments used were questionnaires, observation, and interview sheets. Data processing was done manually, and computer applications were used to find the correlation and correlation strength. The analysis was presented in distribution tables and narratives.

Validity test in this study, using Pearsons Product Moment data processing carried out with the help of the SPSS program

Examiner criteria:

If r is calculated table (2-sided test with sig. 0.05) then the instrument or question items are significantly correlated with the total score (declared valid).

The results of the validity test in this study were valid because each question item from the questionnaire has met the test criteria

RESULT AND DISCUSSION

The method used to determine the age frequency of respondents was a questionnaire. The age was divided into three categories, namely < 36 years, 36-45 years, and > 45 years. The age distribution of the PG Poerwodadie Magetan manufacturing station worker was described below:

Table 1. The distribution of the worker age based on range

No.	Age	Number	Percentage (%)
1	< 36 years	17	21,2
2	36-45 years	32	40
3	> 45 years	31	38,8
		80	100

Based on table 1, which described the age frequency distribution of the workers of the PG Poerwodadie Magetan manufacturing station, 17 respondents (21.2%) aged <36 years, 32 respondents (40%) aged 36-45 years, and 31 respondents (38.8%) aged >45 years.

The working period was divided into three categories, namely <6 years, 6-10 years, and > 10 years. Distribution of working period of PG manufacturing station employees. Poerwodadie Magetan as described below:

Table 2. The distribution of the worker working period based on range

No	Working period	Number	Percentage (%)
1	< 6 years	14	17,5
2	6-10 years	30	37,5
3	> 10 years	36	45
		80	100

Based on table 2, the results show at most 36 respondents (45%) with a working period > 10 years. Followed by 30 respondents (37.5%) with a working period of 6-10 years and 14 respondents (17.5%) with a working period of <6 years.

Knowledge was defined as the respondent's level of understanding about the importance of PPE, including knowledge, objectives, benefits, and functions of PPE. In this study, the classification of knowledge was divided into 2, namely good knowledge and poor knowledge. The distribution of knowledge of PG manufacturing station employees. Poerwodadie Magetan are as follows:

Table 3. The distribution of worker knowledge

No	Knowledge	Number	Percentage (%)
1	Good	32	40
2	Poor	48	60
		80	100

Based on the questionnaire results, 48 respondents (60%) had poor knowledge, and 32 respondents (40%) had good knowledge.

The classification of attitudes in this study was categorized into 2, namely good and poor attitudes towards PPE. The results of the attitudes distribution of the PG Poerwodadie Magetan manufacturing station employees were shown in the table below:

Table 4. The distribution of worker attitude

No	Attitude	Number	Percentage (%)
1	Baik	40	50
2	Kurang	40	50
		80	100

Based on the questionnaire results, it shows that the attitude of workers was balanced, 40 respondents (50%) had a good attitude, and 40 respondents had a poor attitude towards PPE (50%).

In this study, the observational method was used to determine the frequency of PPE compliance. The classification of compliance was categorized into 2, namely compliant and non-compliant. The results of the frequency distribution of PPE compliance were shown in table 5 below:Table 5. The distribution of worker compliance

No	Compliance	Number	Percentage (%)
1	Compliant	34	42,5
2	Non-Compliant	46	57,5
		80	100

Based on the table above, most (57.5%) of the respondents were still not compliant with using PPE.

The Correlation between age and PPE compliance

To evaluate the strong correlation between age and PPE compliance, statistical tests were

carried out using Phi and Cramer's V. The results were shown in table 6 below:

Tabel 6. The correlation between age and PPE compliance

Compliance		C	NC	Total	<i>Phi and Cramer's V</i>
WU	<36	3	14	17	0,337
	36-45	12	20	32	
	>45	19	12	31	
Total		34	46	80	

Description :

C = compliant
 NC = not compliant
 WU = worker age
 < 36 = < 36 years
 36-45 = 36-45 years
 >45 = >45 years

Table 6 shows that most respondents aged < 36 years and 36-45 years were not compliant with PPE. While respondents aged >45 years were primarily obedient in using PPE. Phi and Cramer's V test's value results were 0.337. Hence it could be concluded that the respondent's age and the PPE compliance had a moderate or strong correlation.

Age is an essential factor that business owners consider in giving work to someone. According to Suwardi (2018), young people are relatively more prone to work accidents compared to the elderly because young workers tend to be in a hurry and careless. Meanwhile, those belonging to the elderly are generally more careful and aware of the severity and danger than younger workers.

Tabel 7. The correlation between working period and PPE compliance

Compliance		C	NC	Total	<i>Phi and Cramer's V</i>
WP	<6	2	12	14	0,329
	6-10	11	19	30	
	>10	21	15	36	
Total		34	46	80	

Source : primary data .2021

Description :

C = compliant
 NC = not compliant
 WP= working period
 < 6 = < 6 years
 6-10 = 6-10 years
 >10 = >10 years

Table 7 showed that respondents with a working period of < 6 years were primarily non-compliant in using PPE. Respondents with a working period of 6-10 years were primarily non-

Based on the results of statistical tests, there is a moderate relationship between the age of workers and non-compliance in the use of PPE. This study was in line with Khairuddin (2015), which stated that the age of workers and the PPE compliance had a moderate level of correlation.¹⁰

This study was in contrast with Aprinita, which stated that the age of workers and PPE compliance did correlate.¹¹

Also, this study was in line with Suwardi's theory which stated that the older the worker, they tend to be more careful and aware of the severity of the disease and the recovery time. So, practically, elderly workers were more obedient in using PPE than the younger ones.

The correlation between working period and PPE compliance

To evaluate the strong correlation between working period and PPE compliance, statistical tests were carried out using Phi and Cramer's V. The results were shown in table 7 below:

compliant in using PPE. While respondents with a working period of > 10 years were primarily obedient in using PPE. Phi and Cramer's V test's value results were 0.329. Hence it could be concluded that working period and PPE compliance had a moderate or strong correlation.

Experience is a combination of knowledge and behavior, where knowledge resulted from understanding after sensing a particular object, while the behavior was all forms of responses from individuals to their environment. The working period was identical to experience. The

longer the working period, the more experience he had. The working period was one of the factors in the characteristics of the worker that shape behavior. Based on Apriluana (2016), the longer the working period, the more familiar the worker would be with the conditions of the workplace environment. If they were familiar with the conditions of the workplace environment and the hazards of their work, they would have good PPE compliance.¹²

The experience gained in the workplace will be interrelated with the length of work a person can get, the longer a person works the more experience and the higher his knowledge and skills.¹³

Based on the previous study, statistical tests showed that most workers who had a working period of >10 years were obedient in using PPE. Meanwhile, workers with a working period of 6-10 years and <6 years were primarily non-compliant in using PPE. Workers with a working period of >10 years generally understand the risk of injury if they did not use PPE properly, such as the long recovery process. If they were familiar with the conditions of the workplace environment and the hazards of their work, they would have good PPE compliance.¹⁴

Tabel 8. The correlation between knowledge and PPE compliance

Compliance		C	NC
K	G	19	13
	P	15	33
Total		34	46

(Source : primary data, 2021)

Description :

- C = compliant
- NC = not compliant
- K = knowledge
- G = good
- P = poor

Based on table 8, the results show that respondents with good knowledge of PPE were mostly compliant in using PPE. In contrast, respondents with poor knowledge of PPE were not compliant in using PPE. Phi and Cramer's V test's value results were 0.279 with r value > 0.25 and < 0.5, so it can be concluded that respondents' knowledge and PPE compliance had a moderate or Knowledge resulted from 'knowing,' which happened if the person had sensed over a particular object. Senses were manifested in two ways, the five senses of the eye and the sense of ear (Notoatmodjo, 2014). Knowledge of objects in every person had different levels.¹⁷

Knowledge is the resultant of the senses of sight and hearing that affect one's knowledge

In this study, the working period and PPE compliance had a strong correlation. The study was in line with Fairyo et al. (2018), which stated working period and PPE compliance in PT. X had a significant correlation.¹⁵

The working period was defined as the experience of workers in mastering their field of work. In general, workers with a lot of work experience were easier to understand the tasks assigned to them compared to workers with little experience. Experience, in any case, would further increase vigilance, such as avoiding work accidents resulting from non-compliance in using PPE. As the working period in the company increased, the understanding of the work types and the risks would be increased. In contrast with new workers who did not know the ins and outs of the type of work, let alone its safety in the workplace.¹⁶

The correlation between worker knowledge and PPE compliance

To evaluate the strong correlation between knowledge and PPE compliance, statistical tests were carried out using Phi and Cramer's V. The results were shown in table 8 below:

and behavior. So that knowledge can be obtained at any time in everyday life.¹⁸

Based on the results of statistical tests, the workers' knowledge and PPE compliance in PG-Poerwoto and Magetan had a strong correlation. Table 5.8 described that workers with a good level of knowledge were more obedient in using PPE. Meanwhile, workers with poor knowledge tend to be disobedient in using PPE. This study was in line with Puji, Andri Dwi et al. (2017) (19), which stated that the workers' knowledge and PPE compliance significantly correlated. A study by Iriani (2019) stated that workers with a good level of knowledge were 14 times more obedient in using PPE than nurses with poor knowledge of PPE.^{19,20}

Knowledge was the foundation of the behavior. The inadequate knowledge of PPE made the worker careless about the importance of PPE in the workplace. As a result, these workers were more susceptible to work accidents or occupational diseases than workers with good knowledge of PPE.²¹ The company had provided socialization about OHS, but it was less specific regarding PPE use, so it caused some workers to still had poor knowledge of PPE.

The correlation between attitude and PPE compliance

To evaluate the strong correlation between worker attitude and PPE compliance, statistical tests were carried out using Phi and Cramer's V. The results were shown in table 9 below:

Tabel 9. The correlation between attitude and PPE compliance

Compliance		C	NC	Total	Phi and Cramer's V
A	G	16	24	40	0,051
	P	18	22	40	
Total		34	46	80	

(Source: primary data, 2021)

Description :

- C = compliant
- NC = not compliant
- A = attitude
- G = good
- P = poor

Table 9 showed that respondents with a good attitude toward PPE partially did not obey in using PPE. Meanwhile, respondents with poor attitudes about PPE most of them were not obedient in using PPE. Phi and Cramer's V test's value results were 0.051 where r value > 0 and < 0.25 , so it can be concluded that the attitude of the respondents with PPE compliance had a weak or no correlation.

The attitude was a person's closed response to a particular stimulus or object, which already involved the relevant opinion and emotion (happy-not happy, agree-disagree, good-bad, etc. (Notoadmojo, 2014). So, PG Poerwodadie had a balanced attitude, where 50% of workers had a good attitude, and 50% had a poor attitude.

Based on the results of statistical tests using Phi and Cramer's, the attitude factor had a very weak correlation with the behavior of using PPE with a value of 0.051, so it can be interpreted that the worker's attitude factor did not correlate with PPE compliance.

The results of this study were explained by Notoatmodjo's (2014) theory regarding the causes of individual behavior, which stated that attitudes caused individuals to approach or stay away from other or objects. A positive attitude towards values did not always manifest in real action. This was due to several reasons, including:

1. Attitude will manifest in action depending on the environment/situation at that time.
2. Attitudes will be followed or not followed by actions that refer to the experiences of others.
3. Attitude is followed or not followed by an action based on a lot or little experience of a person.
4. In any society, the values that guide everyone in carrying out social life always apply.

This study was in line with Gunawan (2016), where workers' attitudes and behavior towards personal protective equipment significantly correlated. The poor attitude of using personal protective equipment might be caused by factors such as the poor knowledge of PPE

because knowledge could influence decision-making.²²

CONCLUSION

The study results showed a correlation between worker age and PPE compliance (Personal Protective Equipment) in the manufacturing station at PG. Poerwodadie. Phi and Cramer's V test's value results were 0.337. There was a correlation between the working period and PPE compliance at PG. Poerwodadie because Phi and Cramer's V result value were 0.329. There was a correlation between workers' knowledge and PPE compliance in PG. Poerwodadie because Phi and Cramer's V result value were 0.279. There was no correlation between workers' attitudes and PPE compliance in PG. Poerwodadie because Phi and Cramer's V result value were 0.051 where $r > 0$ and < 0.25 .

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