

## AN ANALYSIS OF THE RELATIONSHIP BETWEEN EMPLOYEE SAFETY BEHAVIOR AND THE USAGE OF PERSONAL PROTECTIVE EQUIPMENT

Diyah Purwitasari<sup>1</sup>, Ardi<sup>2</sup>  
Politeknik Pelayaran Surabaya  
diyah.purwitasari@poltekel-sby.ac.id

### ABSTRAK

Penelitian ini bertujuan untuk menganalisis hubungan keselamatan kerja dengan perilaku penggunaan PPE (Personal Protective Equipment) di atas kapal. Keselamatan kru kapal dalam bekerja harus diperhatikan, mengingat kecelakaan dapat terjadi kapan saja. Untuk menunjang keselamatan, kru kapal perlu dibekali perilaku disiplin saat bekerja. Seperti ketika melakukan pekerjaan yang diharuskan menggunakan alat keselamatan. Jika perilaku ini dijadikan disiplin saat bekerja, maka kru kapal dapat terhindar dari kecelakaan. Penelitian ini dilaksanakan selama 12 bulan. Data diambil dengan cara dokumentasi secara langsung, observasi kru kapal saat bekerja, dan pemberian kuisioner untuk mengetahui keselamatan kerja kru kapal. Berdasarkan uji korelasi dengan Analisis Regresi Linear Sederhana ternyata terdapat hubungan yang baik dan signifikan antara perilaku penggunaan PPE terhadap keselamatan kerja kru kapal. Hal ini dibuktikan dengan persamaan korelasi dengan hasil koefisien ( $r$ ) sebesar 0,903 (berupa hubungan positif). Hal ini berarti jika variabel perilaku penggunaan PPE meningkat, maka akan diikuti oleh variabel keselamatan kerja yang meningkat pula, begitupun sebaliknya.

**Kata kunci: Kru Kapal, Keselamatan kerja, Penggunaan Personal Protective Equipment**

### ABSTRACT

*This research focused on analyzing the relationship between work safety behavior and the usage of PPE (Personal Protective Equipment) on board. The safety of the ship's crew at work must be considered because accidents can happen at any time. To support safety, the ship's crew needs to be equipped with disciplined behavior while working. Like when doing work that is required to use of safety equipment. If this behavior is used as a discipline while working, then the ship's crew can avoid accidents. This research was conducted for 12 months. Data was collected through direct documentation, observation of the ship's crew while working, and giving questionnaires to determine the work safety behavior of the ship's crew. Based on the correlation test with Simple Linear Regression Analysis, it turns out that there is a good and significant relationship between the use of PPE on the safety behavior of ship crews. This is evidenced by the correlation equation with a coefficient ( $r$ ) of 0.903 (in the form of a positive relationship). This means that if the PPE usage variable increases, it will be followed by the work safety behavior variable which also increases and vice versa.*

**Keywords: Occupational Safety Behavior, Personal Protective Equipment, Ship's crew**

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### INTRODUCTION

Safety at work is very important for a worker, whether working on a ship or while on land (Busyairi et al., 2014; Junaedi et al., 2013; Salafudin et al., 2013; Wahyu Hati,

2015). For example, the crew of the MV Milestone ship fell from the ship due to carelessness while working. Therefore, ship crews working at sea must be careful in their work to avoid all kinds of accidents that might occur.

The availability of safety equipment on sea transportation is also an important aspect in the smooth running of work. PPE (Personal Protective Equipment) is a piece of tools that employees use to protect all or part of the body from potential hazards in the workplace (Edigan et al., 2019; Farsida & Zulyanda, 2019; Fitriana & R. Sari, 2019; Watu et al., 2021). Every job that contains potential work hazards and risks has its own PPE requirements to make it safe for the workers themselves and those around them.

The government has made rules regarding work safety, which are contained in Law no. 1 of 1970. The contents of the regulation are that every worker has the right to safety at work and other people who are in the workplace are also guaranteed safety. Regulations regarding Safety and Health at Work must be emphasized by companies, in order to protect workers from accidents or occupational diseases (Asmara & Rahayu, 2019; Hartanto & Siahaan, 2018; Reza Nadhifa & Prastawa, 2022). This is because work accidents can affect company productivity (Ginting & Suana, 2020; Kartikasari & Swasto, 2017; Ukhisia et al., 2013; Wahyuni et al., 2018).

The behavior of using PPE when working is important to become a habit, considering that work accidents can have a big impact. If every worker, in this case the ship's crew, is disciplined according to the provisions for using PPE to carry out dangerous / risky work, work accidents can be minimized. The minimum risk of work accidents will have a positive impact on work safety. Therefore, it is necessary to analyze how work safety relates to the use of Personal Protective Equipment.

## METHODS

Occupational safety in this study is divided into 2 aspects (Safety Compliance and Safety Participant). This research is a quantitative data type using a data collection instrument in the form of a questionnaire. Data from the answers of the ship's crew on the questionnaire were then processed by Simple Linear Regression Analysis to get the value of the relationship between the two variables. Research conducted at PT. Samudera Indonesia ship MV. H Whaleshark for 12 months during the year 2020-2021. The object of this study were 21 ship crew respondents who were given a questionnaire. The following details the statements in the questionnaire:

**Safety Compliance is described as the main activities performed by individuals to maintain safety in the workplace.**

Table 1. Safety Compliance Questionnaire

No	Description	SA	A	D	SD
		4	3	2	1

1	I follow the standard operating procedures set by the company.				
2	I comply with company regulations to always wear PPE at work				
3	There are personnel who perform maintenance on work safety equipment on board				
4	I followed the manufacturer's directions for using PPE				
5	I always check the completeness of PPE before and after finishing work				

**Safety Participant is described as acting in ways that don't directly benefit one's health but that support a healthy environment.**

Table 2. Participant Safety Questionnaire

No	Description	SA	A	D	SD
		4	3	2	1
1	Maintenance of work safety equipment and equipment is one of the routine activities carried out				
2	Familiarization of understanding about PPE is often done by my superiors				
3	Safety meetings are often conducted by my superiors				
4	Colleagues remind each other to use PPE properly				
5	Posters or stickers with pictures about the correct use of PPE can provide a habit of caring about work safety				

Table 3. Questionnaire on the use of PPE

No	Description	SA	A	D	SD
		4	3	2	1
1	I always use safety shoes when working on a ship				
2	I always use a safety helmet when working on a ship				
3	I always use a wear pack when working on a boat				
4	When working at heights I use safety hazards				
5	I always use safety gloves when working on a boat				
6	I always use safety google when working on a boat				

## RESULTS AND DISCUSSION

### Research sites

This research was carried out on board the MV. H Whaleshark which is another cargo ship with GT. 18108 tonnes. This ship has a call sign YDAV2 with imo number

916838 and the number of crew members is 22 people (including the Master). MV. The H Whaleshark was built in 1997 with a LOA of 169.03 meters and 5 holds. MV. H Whaleshark also loads steel coils (Nickel pig iron and steel structure). These ships usually operate in the waters of Indonesia - China.

Figure 1. MV ship. H Whaleshark



The data was carried out from the crew of the MV ship. H Whaleshark in 2020-2021. List of crews of the MV. H Whaleshark as shown in the table below.

Table 4. List of Crews

No	Name	Position
1	WTW	Master
2	BM	Mate 1
3	AFS	Mate 2
4	MDS	Mate 3
5	SS	Head of engine room
6	ES	Machinist II
7	AN	Machinist III
8	S	Machinist IV
9	RWS	Electrician
10	DH	Bosun
11	EP	Helmsman
12	R	Helmsman
13	DAY	Helmsman
14	H	Foreman
15	AA	Oiler
16	N	Oiler

17	EH	Oiler
18	SR	Oiler
19	DFK	Class
20	YP	Waiter
21	A	Deck Cadets
22	PBA	Machine Cadets

Figure 2. Crane chipping



Figure 3. Main deck painting



### Description of Research Variables

The results of this study are presented to generalize the information obtained while working in the field. This study has two variables, namely the independent variable (X) the use of Personal Protective Equipment and the dependent variable (Y) work safety.

Table 5. Research Variables

Independent Variable (X)	Dependent Variable (Y)
PPE usage behavior	Safety compliance

-	Safety participant
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The operational definition of using Personal Protective Equipment (X) is by observing the proper and correct application of Personal Protective Equipment, while the operational definition of work safety (Y) is following SOPs (Standard Operating Procedures) and participating in maintaining the equipment. work safety so as to improve work safety on board.

**Validity, Reliability, and Hypothesis Test Results**

The effectiveness of the study's questionnaire is evaluated using a validity test. If the statements in the questionnaire can reveal something that the questionnaire can measure with an  $r\text{-count} > 0.433$ , then the questionnaire is said to be effective. The method used to assess the validity of the questionnaire is product moment correlation. Based on the following table 6, the statement test for each questionnaire is valid, because each item has  $r\text{-count} > r\text{-table}$ .

Table 6. Results of the Validity Test of Variable X

No	r-count	r-table	Result
1	0,939	0,433	Valid
2	0,939	0,433	Valid
3	0,949	0,433	Valid
4	0,939	0,433	Valid
5	0,861	0,433	Valid
6	0,857	0,433	Valid

Reliability testing is a questionnaire measure that is a variable measuring instrument. A questionnaire is reliable if the responses to the survey are consistent or consistent over time. If a variable's Cronbach Alpha value is greater than 0.3, it is deemed reliable. Based on table 7 below, for each of the statements in the questionnaire, the value of the reliability test results is categorized as reliable, as shown by the following description:

1. It is said to be reliable if  $r\text{-count} > r\text{-table}$
2. It is said to be unreliable if  $r\text{-count} < r\text{-table}$

Table 7. Reliability Test Results

Variable	Cronbach Alpha	Role of Thumb	Result
X	0,961	0,3	Reliable
Y	0,947	0,3	Reliable

Hypothesis testing is done to prove the truth of the hypothesis that has been made. The test uses a t-test and is designed to determine the effect of independent variables on

the variance of an independent explained dependent variable. The interpretation of the T-test results can be seen in Figure 4 below:

Figure 4. Coefficient T-Test Results

Model		Coefficients <sup>a</sup>				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.857	3.283		2.089	.050
	PERILAKU PENGGUNAAN PPE (X)	1.357	.148	.903	9.157	.000

a. Dependent Variable: KESELAMATAN KERJA (Y)

From the results of the T-test, a sig value of 0.000 was obtained. In this T-test significant  $\alpha = 0.05$ . The criteria used are as follows:

1. If the Sig value  $< \alpha$  then the independent variable has an effect on the dependent variable or  $H_0$  is accepted, which means that there is a relationship between the behavior of using PPE on work safety.
2. If the Sig value  $> \alpha$  then the independent variable has no effect on the dependent variable or  $H_0$  is rejected, which means there is no relationship between the behavior of using PPE on work safety.

Then the result is that  $H_a$  is rejected while  $H_0$  is accepted with the following explanation:

1.  $H_0$ : there is a relationship between the behavior of using PPE on work safety.
2.  $H_a$ : there is no relationship between PPE usage behavior and work safety.

$H_0$  is accepted and  $H_a$  is rejected because the sig value is 0.000 0.05, indicating that there is a relationship between the behavior of using PPE and work safety.

### Data analysis

Table 8. Recapitulation of the Occupational Safety Questionnaire

Score	Many Respondents	Percentage
Very Good 32-40	16	76,20%
Good 24-32	5	23,80%
not enough 18-24	0	0%
very less 10-18	0	0%

The results of all respondents can be rated as good, as can be seen from table 8 above. This is evident from the highest score received, which is 32-40 at a percentage of 76.20%, which means that work safety on the MV ship. H Whaleshark is very good.

Table 9. Recapitulation of the Behavioral Questionnaire on the use of PPE

Score	Many Respondents	Percentage
Very good 18-24	16	76,20%
Good 14-18	5	23,80%
not enough 10-14	0	0%
very less 6-10	0	0%

Table 9 above demonstrates that the responses of all respondents fall into the category of good results. This is evident from the highest rating received, namely 18-24 at a percentage of 76.20%, which means that the behavior of using PPE on MV ships. H Whaleshark is very good. The relationship between PPE use behavior and workplace safety was then investigated using a straightforward linear regression analysis. Data processing using the SPSS 20 program results in a simple linear regression analysis as shown in the figure below:

Figure 5. Results of Simple Linear Regression Analysis 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.903 <sup>a</sup>	.815	.806	1.75362

a. Predictors: (Constant), PERILAKU PENGGUNAAN PPE (X)

The picture above explains that the value of  $R = 0.903$  and the coefficient of determination (Rsquare) is 0.815. Rsquare ranges from 0 to 1, with a lower the Rsquare value, the less significant the correlation between the two variables, and vice versa. Then the Rsquare value is 0.815 and it can be concluded that the relationship between the two variables is significant.

Figure 6. Simple Linear Regression Analysis Results 2

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	257.857	1	257.857	83.851	.000 <sup>b</sup>
	Residual	58.429	19	3.075		
	Total	316.286	20			

a. Dependent Variable: KESELAMATAN KERJA (Y)

b. Predictors: (Constant), PERILAKU PENGGUNAAN PPE (X)



The picture above shows the value of  $F_{count} = 83,851$  with a significance level of 0.000. Then it is obtained that the research hypothesis is accepted. In this test it is significant  $\alpha = 0.05$  and the criteria used are as follows:

1. If the Sig value  $< \alpha$  then the independent variable has an impact on the dependent variable, or  $H_0$  is accepted.
2. If the Sig value  $> \alpha$  then the independent variable has no impact on the dependent variable, or  $H_0$  is not accepted.

So, the result is that  $H_0$  is accepted with  $H_0$ 's explanation that there is a relationship between personal protective equipment use behavior and occupational safety. This is consistent with investigations that have been made into the following researchers (Anggreani et al., 2022; Joniarta et al., 2022; Novianto, 2015). In addition, good work management will also have a good effect on worker performance (Ningrum et al., 2023; Pradnyawati et al., 2023; Srutiningsih et al., 2023).

## CONCLUSION

The findings and discussion lead to the conclusion that the manner in which PPE (Personal Protective Equipment) is used on the MV ship. H Whaleshark has been very good. This can be seen from the level of safety compliance and safety participant which reached 76.20% apart from the questionnaire the researchers also made observations with the ship's crew and got the result that the ship's crew used PPE properly and correctly. There is a correlation between personal protective equipment (PPE) use behavior and work safety as shown by a significance value of 0.000 with  $\alpha=0.05$ .

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