

Improving Employee Performance Through Occupational Health and Safety Compliance: A Study at the Makassar Port Authority

Arif Fuddin Usman¹, Muhammad Aris Kastian², Zahra Nuraisyah¹, Andi Ningrat¹, Andi Rachmianty³

¹Department of Marine Transportation, AMI Makassar Maritime Polytechnic, Makassar, 90121

²Department of Ship Machinery Engineering Technology, AMI Makassar Maritime Polytechnic, Makassar, 90121

³Department of Ship Operation Engineering Technology, AMI Makassar Maritime Polytechnic, Makassar, 90121

KEYWORDS

*Occupational Safety;
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OHSMS*

ABSTRACT – This study was conducted to determine the effect of the implementation of the occupational safety and health management system (SMK3) on employee work productivity at KSOP Utama Makassar. The results of this study indicate that, simultaneously (F-test), occupational safety and occupational health have a significant positive effect on employee work productivity, accounting for 87.6%. The remaining 12.4% is attributed to other variables not studied by the researcher. In the T-test, occupational safety has a positive effect of 8,422, and occupational health has no effect because the T-count value of -1,302 is smaller than the T-table value of 1,994. So from these results, it can be interpreted that occupational safety has a greater effect on employee work productivity compared to occupational health.

*Corresponding Author | Arif Fuddin Usman | ✉ (arifusman575@gmail.com)

INTRODUCTION

Indonesia is referred to as an archipelagic country because its ocean area is larger than its land area, which makes water transportation play a vital role [1]. Ports in Indonesia in the past were very different from those today [2]. With the existence of a port, economic activities can be smoother; most exports and imports are sent by sea, which means they require a port or a place to moor [3]. Why a port, because the number of goods that can be transported by ship is greater than that transported by other fleets (air and land) [4]. For this reason, sea transportation by ship and via ports used by service users must receive the highest possible safety and service guarantees so that it runs smoothly [5].

The Harbormaster Service collaborates with relevant parties, including port authorities, government agencies, and international institutions, to ensure seamless shipping operations [6]. The Makassar Main Harbormaster and Port Authority Office (KSOP) is an institution responsible for regulating and supervising harbormaster activities in its area. As an institution that involves employees in activities that have the potential to have high risks, it is important to implement an OHS management system, which is a crucial step in maintaining the Safety and Health of workers and increasing work efficiency and productivity [7].

The purpose of Occupational Safety and Health (OHS) is to prevent accidents and occupational diseases. In addition, OHS also functions to protect all sources of production, both employees and those who receive services, so that they can perform effectively [8]. In general, the function of OHS is to ensure that work activities in the company can run safely, comfortably, and smoothly [9]. Occupational Safety factors are Hazard, Risk, Incident, Accident, Near-miss [10]. While Occupational Health factors are ergonomics, occupational diseases [11][12].

Employee productivity in this study is efficient and optimal service to service users, namely, shipping companies, as a benchmark for the assessment of human resources [3][13]. Work productivity functions to measure employee work productivity. An indicator is needed, namely, ability, increasing the results achieved, work enthusiasm, self-development, quality, and efficiency [14]. Factors that influence work productivity are education level, skills [15], work discipline, motivation [16] nutrition and health, income level, and social security [17], work environment and climate [16], industrial relations, technology, production facilities [18], management, and opportunities for achievement [15].

Analysis of the implementation of the K3 management system at the Harbormaster's Office and the Makassar Main Port Authority is important. Through this analysis, it is expected to increase awareness of the importance of implementing the K3 management system in the work environment of the Harbormaster's Office and the Makassar Main Port Authority, and help create a safe, healthy, and productive work environment for all employees.

METHOD

The research design is a structured, economical, and appropriate research step in accordance with the research objectives, so that the data obtained is accurate. Quantitative research methods can be interpreted as research methods based on the philosophy of positivism, used to study specific populations or samples, collect data using research instruments, and analyze quantitative/statistical data to test established hypotheses [19]. This study employs descriptive analysis with a quantitative approach, utilizing multiple regression analysis techniques supported by the SPSS program. This approach is used to determine the effect of occupational health and safety on the implementation of the K3 management system on employee work productivity.

This research was conducted at the Makassar Harbormaster and Main Port Authority Office. The KSOP office is located at Jl. Satando I No. 55, Tamalabba, Ujung Tanah District, Makassar City, South Sulawesi. This activity was carried out from February 2024 to August 2024. The population of this study was all employees of the Makassar Harbormaster and Main Port Authority Office, totaling 265 people ^[14]. A sample is a part of the number and characteristics possessed by the population [20]. And determining the sample size in this study can use the Slovin formula [21] as follows:

$$n = \frac{N}{1 + N \cdot e^2} \quad (1)$$

RESULTS AND DISCUSSION

This section presents the results of the analysis regarding the implementation of the Occupational Health and Safety Management System (SMK3) and its impact on employee productivity at the Makassar Main Harbormaster and Port Authority Office (KSOP). The analysis focuses on the influence of occupational safety and health factors on employee productivity, based on data obtained through a quantitative approach. Subsequently, the analysis results are discussed in relation to the research objectives, as well as relevant theories and findings from previous studies.

Validity Test

Table 1. Validity Test of Research Variables

Variable	Item	R Count	R Table	Description
Safety (X1)	X1.1	0.862	0.2303	Valid
	X1.2	0.949	0.2303	Valid
	X1.3	0.930	0.2303	Valid
	X1.4	0.974	0.2303	Valid
	X1.5	0.854	0.2303	Valid
	X1.6	0.915	0.2303	Valid
	X1.7	0.851	0.2303	Valid
	X1.8	0.739	0.2303	Valid
	X1.9	0.739	0.2303	Valid
	X1.10	0.929	0.2303	Valid
Health (X2)	X2.1	0.886	0.2303	Valid
	X2.2	0.898	0.2303	Valid
	X2.3	0.889	0.2303	Valid
	X2.4	0.920	0.2303	Valid
	X2.5	0.907	0.2303	Valid
	X2.6	0.909	0.2303	Valid
	X2.7	0.867	0.2303	Valid
	X2.8	0.873	0.2303	Valid
	X2.9	0.886	0.2303	Valid
	X2.10	0.888	0.2303	Valid
Work Productivity (Y)	Y.1	0.819	0.2303	Valid
	Y.2	0.812	0.2303	Valid
	Y.3	0.968	0.2303	Valid

Y.4	0.965	0.2303	Valid
Y.5	0.968	0.2303	Valid
Y.6	0.912	0.2303	Valid
Y.7	0.944	0.2303	Valid
Y.8	0.965	0.2303	Valid
Y.9	0.965	0.2303	Valid
Y.10	0.769	0.2303	Valid

Source: SPSS Data Processing Results, 2024

The table above shows that all statement items have a positive correlation coefficient value and are greater than the R-table ($r_{\text{count}} > r_{\text{table}}$). This means that the data obtained is valid, and further data testing can be carried out.

Reliability Test

Table 2. Validity Test of Research Variables

No	Variable	Cronbach' Alpha	Reliability Limit	Description
1	Safety (X1)	.972	0.6	Reliable
2	Health (X2)	.971	0.6	Reliable
3	Work Productivity (Y)	.971	0.6	Reliable

Source: SPSS Data Processing Results, 2024

The table above shows that all variables are reliable because the Cronbach's alpha value is greater than 0.60, so it can be concluded that the respondents' answers are consistent.

Normality Test

Normality test using One Sample Kolmogorov-Smirnov is an effective tool to determine whether the data follows a normal distribution, with the provision that if the p-value is above 0.05, then the data is normally distributed. If the results of the one-sample Kolmogorov-Smirnov test show a significant value below 0.05, then the data is not normally distributed [22]. The results of the normality test can be seen in Figure 1:

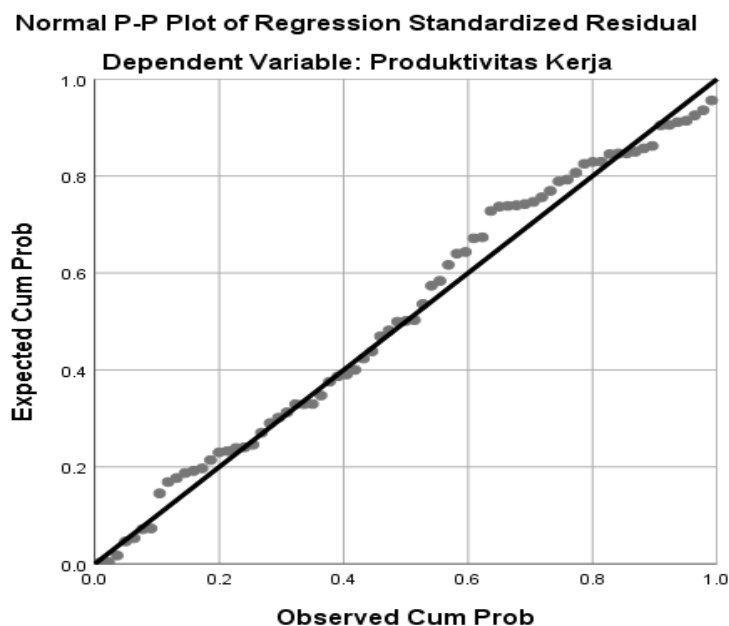


Figure 1. Normality Test

In the image above, the graph is equipped with a statistical test, one of which is the non-parametric Kolmogorov-Smirnov statistical test. If the K-S result has $p > 0.05$, then it can be said that the unstandardized residual is normal. The results of the test can be seen in Table 3:

Table 3. One-Sample Kolmogorov-Smirnov Test

		<i>Unstandardized Residual</i>
N		73
<i>Normal Parameters^{a,b}</i>	<i>Mean</i>	.0000000
	<i>Std. Deviation</i>	4.39961817
<i>Most Extreme Differences</i>	<i>Absolute</i>	.101
	<i>Positive</i>	.048
	<i>Negative</i>	-.101
<i>Test Statistic</i>		.101
<i>Asymp. Sig. (2-tailed)</i>		.065 ^c
<i>Monte Carlo Sig. (2-tailed)</i>	<i>Sig.</i>	.421 ^d
<i>99% Confidence Interval</i>		
<i>Lower Bound</i>		.408
<i>Upper Bound</i>		.434

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Source: SPSS Data Processing Results, 2024

Based on the table above, the significant value of Asymp. Sig (2-tailed) of 0.065 is greater than 0.05, so the residual is declared normally distributed because it has met the classical assumption of normality.

Coefficient of Determination

Table 4. Determination Test Model Summary^b

Model	R	<i>R Square</i>	<i>Adjusted</i>	<i>Std. Error</i>	<i>Change Statistics</i>		<i>Durbin-Watson</i>	
			<i>R</i>	<i>of the</i>	<i>R Square</i>	<i>F Change</i>	<i>Sig. F</i>	
			<i>Square</i>	<i>Estimate</i>	<i>Change</i>		<i>Change</i>	
1	.938 ^a	.880	.876	1.803	.880	256.497	<.001	1.425

a. Predictors: (Constant), Work Safety, Work Health

b. Dependent Variable: Work Productivity

Source: SPSS Data Processing Results, 2024

Based on the results of the Determination Coefficient Test above, the Adjusted R Square value is known to be 0.876, which means that K3 affects work productivity of 87.6%, and the remaining 12.4% is influenced by other variables not proposed in the study.

Multiple Regression Analysis

In this study, the T-test and F-test were used to determine the influence of the independent variable on the dependent variable partially and simultaneously. The following is a summary of the results of the multiple regression analysis in Table 5:

Table 5. Summary of Multiple Regression Analysis

Variable	Regression Coefficient	T Count	Sig.
Constant	2.852		

X1	1.099	8.422	<.001
X2	-.165	-1.302	.197
F	= 256.497		<.001
Adjusted R-Square	= 0.876		

The formula for the Multiple Regression Analysis equation is as follows:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + e \quad (2)$$

$$\text{or } Y = 2.852 + 1.099 + (-0.165) + e \quad (3)$$

From the equation, it can be explained that:

- The constant value (a) has a positive value of 2.852. A positive sign means that it shows a unidirectional influence between the independent variable and the dependent variable. This shows that if all independent variables, including occupational safety (X1) and occupational health (X2), have a value of 0 percent or do not change, then the work productivity value is 0.003.
- The regression coefficient value for the occupational safety variable (X1) has a positive value of 1.099. This shows that if occupational safety increases by 1%, then work productivity will increase by 1.099, assuming that other independent variables are considered constant.
- The regression coefficient value for the occupational health variable (X2) has a negative value of -0.165. This shows that if occupational health decreases by 1%, then employee work productivity will decrease.
- The results of testing with multiple linear regression obtained an equation that shows the regression coefficient of the two independent variables ($\beta_1\beta_2$), which is positive (+). This means that if the occupational safety and health variables are met, it will result in increased employee work productivity. Conversely, if it is negative (-), this means that if the occupational safety and health variables are not met, it will result in decreased employee work productivity.

From the equation, it can be explained that

If $T_{\text{count}} > T_{\text{table}}$, then it can be said to be significant or influential; the level of significance is 0.05. If the sig value ≤ 0.05 , then the hypothesis is accepted. The following can be seen in Table 6:

Table 6. T-Test (Partial Test) Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.852	1.925		1.482	.143
1 Work Health	-.165	.127	-.170	-1.302	.197
Work Safety	1.099	.130	1.097	8.422	<.001

a. Dependent Variable: Work Productivity

Source: SPSS Data Processing Results, 2024

Based on the T-test results contained in the output Coefficients table, the significance value (Sig) and the comparison between the calculated T value and the T table are known. Before conducting a test to determine whether there is an effect of occupational safety on employee work productivity, and occupational health on employee work productivity separately. There are hypotheses proposed, namely:

- H0: There is no significant effect of the independent variable (X1/2) on the dependent variable (Y).
- H1: There is an effect of Occupational Safety (X1) on Employee Work Productivity (Y) partially.
- H2: There is an effect of Occupational Health (X2) on Employee Work Productivity (Y) partially.

Based on the Sig Value for the T Test (H1), which has a Sig value of 0.001, which means that the Sig Value $0.001 < 0.05$, it can be interpreted that H1 is accepted and H0 is rejected. Based on the T-value of 8.422 with a T-table of 1.994, which means that T-value $8.422 > T\text{-table } 1.994$, it can be interpreted that Occupational Safety has a significant effect on Employee Work Productivity. Based on the Sig Value for the T-test (H2), it has a value of 0.197, which means that the Sig Value $0.197 > 0.05$, it can be interpreted that H2 is rejected and H0 is accepted. Based on the T-value of -1.302 with a T-table of 1.994, which means that T-value $-1.302 < T\text{-table } 1.994$, it can be interpreted that Occupational Health does not affect Employee Work Productivity.

F Test (Simultaneous Test)

If the significance <probability and if Fcount > Ftable, then it can be said that the independent variable can explain the dependent variable simultaneously. The probability used is 5% or 0.05. The following can be seen in Table 7:

Table 7. F Test (Simultaneous Test) ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1.668.396	2	834.198	256.497	<.001 ^b
Residual	227.659	70	3.252		
Total	1.896.055	72			

a. Dependent Variable: Work Productivity

b. Predictors: (Constant), Work Safety, Work Health

Source: SPSS Data Processing Results, 2024

Based on the F Test Results contained in the Anova output table, the Sig. value is 0.001. The Fcount value is 256,497, and the Ftable value is 3.126. Because the Sig. value is $0.001 < 0.05$, and the Fcount value $> F\text{table}$ ($256,497 > 3.126$), it is in accordance with the decision that the independent variable can explain the dependent variable simultaneously.

CONCLUSION

K3 has a very significant positive effect of 87.6% on work productivity at the Harbormaster and Main Port Authority Office of Makassar because of the Sig. The value is known. $0.001 < 0.05$, and the Fcount Value $> F\text{table}$ ($256.497 > 3.126$), the remaining 12.4% is influenced by other variables not submitted in the study. If the office pays more attention to the importance of implementing K3 in work, the work productivity of employees will be more advanced and developed.

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