

Employee productivity in Indonesia's Port Industry: Do Occupational Safety and Health Programs and work discipline matter? Evidence from a case study of PT Pelabuhan Indonesia (Persero) Regional 4, Makassar



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ABSTRACT

Employee productivity plays a fundamental role in enhancing organizational performance, particularly within the port industry, where operational efficiency and dependable service delivery are essential for achieving organizational objectives. This study investigates the effects of Occupational Safety and Health (OSH) programs and work discipline on employee productivity at PT Pelabuhan Indonesia (Persero) Regional 4 Makassar. Adopting a quantitative research approach, data were collected from employees in the Operations and Engineering Division using purposive sampling and analyzed through multiple linear regression to evaluate the influence of the independent variables on employee productivity. The findings indicate that OSH programs do not exert a significant influence on employee productivity, whereas work discipline positively contributes to improving employee productivity. Furthermore, the combined effect of OSH programs and work discipline provides substantial explanatory power in understanding variations in employee productivity. These findings suggest that in organizations with well-established safety management systems, productivity is influenced more strongly by behavioral and managerial factors, particularly employee discipline, than by the direct implementation of OSH initiatives. This study contributes to the human resource management and occupational safety literature by providing empirical evidence from the port industry. In addition, it offers practical implications for managers seeking to enhance employee productivity by strengthening work discipline while maintaining and continuously improving sustainable occupational safety and health management systems.

Keywords: *Employee Productivity; Occupational Safety and Health; Work Discipline; Human Resource Management; Port Industry*



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INTRODUCTION

Occupational Safety and Health (OSH) constitutes a strategic component of human resource management by protecting employees from workplace hazards while enhancing organizational performance and supporting long-term operational sustainability (Melhem et al., 2024). Effective implementation of OSH practices contributes to preventing workplace accidents, reducing operational interruptions, controlling organizational costs, and promoting employee well-being and productivity (Hasle et al., 2021; Patel et al., 2022). Because port operations involve substantial occupational hazards, employees routinely perform tasks such as cargo handling and operating heavy equipment. Therefore, effective safety management should integrate systematic hazard identification, risk reduction measures, proper PPE utilization, structured safety training programs, and continuous monitoring to ensure a safe working environment (Gul, 2020; Mubarak et al., 2025).

The organization has successfully maintained a zero-accident record among 210 employees, as reported in the P2K3 Quarterly IV Report (2025), indicating the effectiveness of its Occupational Safety and Health (OSH) management system. However, maintaining this achievement requires more than effective safety programs; it also depends on employees' ongoing compliance with organizational policies, standard operating procedures, and workplace safety requirements (Asiedu et al., 2025). Therefore, work discipline may play a more decisive role in enhancing employee productivity within organizations that have already established mature occupational safety management systems (Data, et al., 2026).

The P2K3 report for October–December 2025 recorded zero workplace incidents, reflecting effective occupational safety management and strong employee compliance with safety procedures. This provides an important context for examining whether OSH programs continue to influence employee productivity in organizations with mature safety management systems (Farras et al., 2025).

Beyond the implementation of Occupational Safety and Health (OSH) programs, work discipline constitutes a critical factor influencing employee productivity, as it demonstrates employees' adherence to organizational policies, standard operating procedures, attendance regulations, and established work schedules (Deviani et al., 2023; Rostina et al., 2020). Employees who exhibit a high level of work discipline are more likely to perform their responsibilities consistently, complete assigned tasks within established deadlines, and make meaningful contributions to the achievement of organizational goals (Tasya et al., 2024). In the port services industry, discipline is particularly critical because employee behavior directly influences operational coordination, service efficiency, and workplace safety (Firmansyah et al., 2024).

Work discipline also reinforces the effectiveness of OSH programs. While OSH provides policies and preventive mechanisms to reduce workplace risks, its success depends on employees' compliance with safety procedures and operational standards (Salguero-Caparrós et al., 2020). Consequently, the integration of effective OSH practices and strong work discipline is expected to foster a safe and productive work environment (Ahmad, 2022).

This issue is especially relevant to PT Pelabuhan Indonesia (Persero) Regional 4 Makassar, where high-risk operational activities require strict compliance with safety regulations. Although the company achieved a zero-accident record in 2025, sustaining operational performance depends on both effective safety management and employee discipline (Wirza et al., 2025; Zwetsloot, 2025).

Despite extensive research, important gaps remain. Most previous studies have examined OSH and work discipline separately, focused on manufacturing or construction sectors, and provided limited evidence from Indonesia's port industry, particularly in Eastern Indonesia (Lari, 2024; Setyabudhi et al., 2026). This study seeks to address the identified research gaps by investigating the individual and combined effects of Occupational Safety and Health (OSH) programs and work discipline on employee productivity in a port organization with a well-established safety management system (Walters & Wadsworth, 2022). The study makes a theoretical contribution to the human resource management literature by demonstrating that the influence of OSH on employee productivity is contingent upon organizational context, while providing empirical evidence that work discipline represents the dominant behavioral factor driving employee productivity.

LITERATURE REVIEW, RESEARCH FRAMEWORK, AND HYPOTHESES

Occupational Safety and Health Program

As a strategic function of human resource management, Occupational Safety and Health (OSH) programs are designed to prevent workplace hazards, protect employees, and support long-term organizational sustainability and operational effectiveness (Melhem et al., 2024; Olson et al., 2023). This importance is particularly evident in the port services industry, where employees are routinely exposed to high-risk activities, including cargo handling, heavy equipment operations, and loading and unloading processes (Goncalves et al., 2025). In these environments, effective safety management minimizes operational disruptions and supports service efficiency (Firmansyah et al., 2024).

While several studies found that effective OSH programs improve productivity by reducing workplace risks and enhancing employee well-being (Lari, 2024), others reported that the effect varies across industries and depends on the maturity of organizational safety management systems (Malakis et al., 2023; Vitrano & Micheli, 2024).

PT Pelabuhan Indonesia (Persero) Regional 4 Makassar provides an appropriate context for this study. The company's zero-accident record reported in the P2K3 Quarterly IV Report (2025) reflects a well-established safety management system (Nampira et al., 2026). However, sustaining this performance requires continuous employee compliance and managerial supervision, making it important to examine whether OSH programs continue to influence employee productivity in organizations with mature safety management systems (Manuele, 2003).

Work Discipline

Work discipline reflects employees' commitment to adhering to organizational policies, established procedures, and expected standards of conduct, including attendance, punctuality, compliance with standard operating procedures (SOPs), and accountability for assigned responsibilities (da Silva Rufino et al., 2025; Sitopu et al., 2021). Beyond rule compliance, work discipline reflects employees' commitment to performing their duties consistently, responsibly, and professionally (Grote, 1995).

Work discipline is particularly important in the port services industry, where operational activities require strict coordination, punctuality, and procedural compliance (Supriatna et al., 2026). Failure to follow operational procedures may disrupt workflow, reduce service efficiency, and increase workplace risks (Reason, 2016). In this study, work discipline is measured through four dimensions: punctuality, compliance with work regulations, responsibility, and adherence to work instructions (Nurdiana & Suherman, 2026).

Previous studies consistently demonstrate that work discipline positively influences employee productivity. Employees who exhibit strong work discipline are more likely to manage their time effectively, comply with organizational procedures, perform assigned duties in accordance with established standards, and achieve higher levels of job performance (Tasya et al., 2024). Empirical evidence from various organizational settings, including Perum DAMRI Lampung, confirms that work discipline significantly improves employee productivity (Syarifuddin, 2023; Yuswardi et al., 2024). However, employee productivity is also shaped by organizational support, workplace safety, and adequate working facilities (Tahir & Hajjad, 2023).

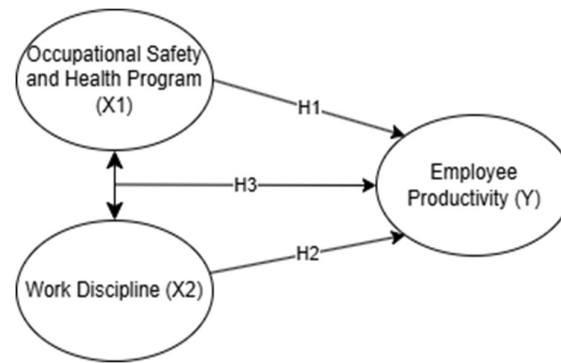
Employee Productivity

Employee productivity refers to the ability of employees to perform their work effectively and efficiently by optimizing their knowledge, skills, time, and available organizational resources to achieve desired performance outcomes (Natsir et al., 2024). Employee productivity encompasses not only the quantity of work completed but also its quality, timeliness, and compliance with organizational standards, making it a key indicator of employees' overall contribution to organizational performance (Akerlele, 2023; Petrick, 2017).

In the port services industry, productivity is particularly important because operational performance depends on effective coordination among employees, equipment, infrastructure, and work procedures (Firmansyah et al., 2024). Employees are expected to carry out their responsibilities with accuracy and efficiency while complying with operational and safety standards to maintain service quality and ensure uninterrupted operational performance (Richards, 2017). In this study, employee productivity is measured through four dimensions: work quality, work quantity, timeliness of task completion, and the ability to perform work according to organizational standards (Basri & Aarsal, 2022). A safe work environment supports operational continuity, while strong work discipline promotes procedural compliance and consistent performance (Wahyudi et al., 2025).

Conceptual Framework

Specifically, OSH Programs provide a safe and healthy working environment, whereas Work Discipline promotes employees' compliance with organizational rules and operational procedures, both of which are expected to enhance productivity (Claro et al., 2025). Accordingly, this study investigates the individual effects of Occupational Safety and Health (OSH) Programs and Work Discipline on Employee Productivity (Iman et al., 2023). The conceptual model underpinning this study is presented in Figure 1.



Source: Developed by author, 2026

Figure 1
Research Framework Model

The Influence of Occupational Safety and Health Programs on Employee Productivity

The relationship between Occupational Safety and Health (OSH) programs and employee productivity is grounded in the premise that a safe and healthy work environment enables employees to perform their responsibilities more effectively and efficiently (Shabani et al., 2023). Effective Occupational Safety and Health (OSH) practices, such as hazard identification, safety training, the provision of PPE, and workplace safety supervision, contribute to reducing workplace accidents, preventing operational disruptions, and improving employee well-being (Meidianto et al., 2025). In high-risk sectors such as port services, effective safety management is essential for maintaining operational continuity and supporting employee performance (Gul, 2020). Accordingly, the following hypothesis is proposed:

H1: *Occupational Safety and Health (OSH) Programs positively and significantly influence Employee Productivity at PT Pelabuhan Indonesia (Persero) Regional 4 Makassar.*

The Influence of Work Discipline on Employee Productivity

Work Discipline is expected to enhance Employee Productivity because employees who consistently comply with organizational policies, work schedules, and standard operating procedures are more likely to utilize their working time efficiently and complete assigned tasks within established deadlines (Sparrow, 2011; Tasya et al., 2024). Such behavior also reduces operational errors and strengthens organizational effectiveness through greater responsibility and adherence to work instructions (Bandura, 2023). This relationship is particularly important in the port industry, where operational efficiency depends on punctuality, coordination, and procedural compliance (Imam & Islam, 2023). Drawing upon the preceding theoretical discussion and empirical evidence, this study proposes the following hypothesis:

H2: *Work Discipline positively and significantly influences Employee Productivity at PT Pelabuhan Indonesia (Persero) Regional 4 Makassar.*

The Influence of Occupational Safety and Health Programs and Work Discipline on Employee Productivity

Employee Productivity is influenced by both organizational systems and employee behavior (Cherian et al., 2021). OSH Programs establish a safe and healthy working

environment, whereas Work Discipline encourages employees to consistently adhere to organizational policies and established operational procedures (Wahyudi et al., 2025). Together, these factors are expected to enhance operational efficiency, reduce workplace disruptions, and improve employee productivity (Ahmadi et al., 2026).

Previous studies also indicate that OSH programs and work discipline jointly contribute to employee productivity (Nuryanti et al., 2021). Grounded in the theoretical rationale and supported by prior empirical studies, the following hypothesis is advanced:

H3: *Occupational Safety and Health (OSH) Programs and Work Discipline jointly have a positive and significant effect on Employee Productivity at PT Pelabuhan Indonesia (Persero) Regional 4 Makassar.*

METHOD

A quantitative research approach was employed to test the proposed hypotheses through the statistical analysis of numerical data (Black, 1999). The population comprised employees of PT Pelabuhan Indonesia (Persero) Regional 4 Makassar, with the study focusing on employees in the Operations and Engineering Division. This division was selected because its employees are directly involved in operational activities and are exposed to higher occupational risks, making them highly relevant to the research variables (Denscombe, 2017). As presented in Table 1, a five-point Likert scale was used to measure respondents' perceptions of all research variables.

Table 1
Likert Scale Research Questionnaire

Response	Score
Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

Source: Dalati & Marx Gómez, 2018

Measurement of Variables

The operational definitions and corresponding measurement indicators are presented in Table 2.

Table 2
Operational Definitions and Measurement of Variables

Variable	Indicators	Operational Definition	Scale
Occupational Safety and Health (OSH) Programs (X ₁)	Hazard Identification; PPE; Safety SOPs; Safety Supervision (Ludy & Eyre, 2024)	Organizational efforts to prevent workplace accidents and protect employee health (Friend & Kohn, 2023).	Five-point Likert
Work Discipline (X ₂)	Punctuality; Compliance with Regulations; Responsibility; Compliance with Work Instructions (Nurdiana & Suherman, 2026)	Employees' compliance with organizational rules and operational procedures (Hu et al., 2012).	Five-point Likert
Employee Productivity (Y)	Work Quality; Work Quantity; Timeliness; Ability to Meet Work Standards (Maryani et al., 2021)	Employees' effectiveness and efficiency in achieving organizational performance targets (Zeynullagil, 2022).	Five-point Likert

Source: Compiled by the authors based on relevant literature, 2026.

Instrument validity was assessed using the Pearson Product–Moment correlation ($p < 0.05$), while reliability was evaluated using Cronbach's Alpha ($\alpha \geq 0.60$) (Nawi et al., 2020; Radeswandri et al., 2021). The regression model was evaluated using the Kolmogorov–Smirnov normality test (Sig. > 0.05), multicollinearity diagnostics (Tolerance > 0.10 ; VIF < 10), and the Glejser heteroscedasticity test (Sig. > 0.05) (Habibzadeh, 2024).

Multiple Linear Regression Analysis

The multiple linear regression model is specified as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where:

- Y = Employee Productivity
- X1 = Occupational Safety and Health Program
- X2 = Work Discipline
- α = Constant
- β_1, β_2 = Regression coefficients
- ε = Error term

The hypotheses were tested using the t-test for partial effects, the F-test for simultaneous effects, and Adjusted R^2 to evaluate the model's explanatory power (Data, Alifya, et al., 2026).

RESULTS AND DISCUSSION

A total of 51 questionnaires were administered to employees in the Operations and Engineering Division of PT Pelabuhan Indonesia (Persero) Regional 4 Makassar. All questionnaires were returned and deemed valid after the screening process, resulting in a 100% response rate. Therefore, all responses were included in the subsequent analyses.

Table 3
Questionnaire Distribution and Response Rate

Description	Number of Questionnaires	Percentage (%)
Questionnaires distributed	51	100.00
Questionnaires returned	51	100.00
Incomplete or invalid questionnaires	0	0.00
Questionnaires eligible for analysis	51	100.00

Sources : Research Data Processed, 2026

Respondent Characteristics

Table 4 presents the respondents' demographic profile. Most respondents were male (86.27%), aged 25–35 years (45.10%), and had worked for more than six years (56.86%). These respondent characteristics suggest that the participants possessed adequate operational experience and a sound understanding of the company's OSH practices as well as its work discipline policies (Mugwagwa, 2021).

Table 4
Demographic Characteristics of Respondents (N = 51)

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	44	86.27
	Female	7	13.73
	Total	51	100.00
Age	< 25 years	13	25.49
	25–35 years	23	45.10
	35–40 years	8	15.69
	> 40 years	7	13.73
	Total	51	100.00
Length of Service	1–3 years	8	15.69
	4–6 years	14	27.45
	> 6 years	29	56.86
	Total	51	100.00

Sources : Research Data Processed, 2026

Descriptive Statistics of Research Variables

The results of the analysis are presented in Table 5.

Table 5
Descriptive Statistics of Research Variables

Variable	Indicator	Mean	Interpretation*
Occupational Safety and Health Program (X_1)	Hazard Identification	3.36	Moderate
	Use of Personal Protective Equipment (PPE)	3.26	Moderate
	Occupational Safety Standard Operating Procedures (SOPs)	3.55	High
	Occupational Safety Supervision	3.50	High
	Overall Mean of OSH Program	3.42	High
Work Discipline (X_2)	Punctuality	3.20	Moderate
	Compliance with Work Regulations	3.32	Moderate
	Responsibility	3.03	Moderate
	Compliance with Work Instructions	3.53	High
	Overall Mean of Work Discipline	3.27	Moderate
Employee Productivity (Y)	Quality of Work Output	3.14	Moderate
	Quantity of Work Output	3.33	Moderate
	Timeliness of Work Completion	3.39	Moderate
	Ability to Meet Work Standards	3.50	High
	Overall Mean of Employee Productivity	3.34	Moderate

Sources : Research Data Processed, 2026

The results show that the OSH Program received the highest overall mean (3.42, High), indicating positive perceptions of workplace safety implementation, particularly regarding safety SOPs (3.55) and safety supervision (3.50). However, the use of personal protective equipment (3.26) received the lowest score within this construct.

Work Discipline recorded a moderate overall mean (3.27). Compliance with work instructions showed the highest score (3.53), whereas responsibility received the lowest (3.03), suggesting the need to strengthen employee accountability.

Similarly, Employee Productivity was rated at a moderate level (Mean = 3.34). Employees scored highest on their ability to meet work standards (3.50), while work quality obtained the lowest mean (3.14).

Overall, the findings indicate that although the company has implemented its OSH Program effectively, improvements in work discipline and employee productivity remain necessary. These preliminary results provide the basis for the subsequent inferential analyses.

Validity Test

Construct validity was evaluated using the Pearson Product-Moment Correlation test (Hidayati et al., 2023). An indicator was considered valid when it exhibited a positive correlation coefficient and a significance value of less than 0.05 (Knief & Forstmeier, 2021). Table 6 summarizes the Pearson correlation coefficients and significance values used to evaluate the validity of each measurement indicator.

Table 6
Validity Test Results

Variable	Indicator	Pearson Correlation	Sig. (2-tailed)	Interpretation
Occupational Safety and Health Program (X ₁)	Hazard Identification (IDB)	0.870	0.000	Valid
	Personal Protective Equipment (APD)	0.778	0.000	Valid
	Safety Standard Operating Procedures (SOP)	0.819	0.000	Valid
	Occupational Safety Supervision (PKK)	0.342	0.014	Valid
Work Discipline (X ₂)	Punctuality (KWT)	0.909	0.000	Valid
	Compliance with Work Regulations (ATRK)	0.963	0.000	Valid
	Responsibility (TGJBK)	0.892	0.000	Valid
	Compliance with Work Instructions (KTISK)	0.911	0.000	Valid
Employee Productivity (Y)	Quality of Work Output (KHK)	0.908	0.000	Valid
	Quantity of Work Output (KUANK)	0.955	0.000	Valid
	Timeliness of Work Completion (KTPW)	0.871	0.000	Valid
	Ability to Meet Work Standards (KPPK)	0.899	0.000	Valid

Sources : Research Data Processed, 2026

As presented in Table 6, all measurement indicators satisfied the construct validity criteria, with Pearson correlation coefficients ranging from 0.342 to 0.963 and significance values below 0.05. These results demonstrate that each indicator adequately reflects its intended construct and is suitable for further statistical analysis.

Reliability Test

Instrument reliability was evaluated using Cronbach's Alpha, with coefficients above 0.60 indicating acceptable internal consistency (Nawi et al., 2020). The results are presented in Table 7.

Table 7
Reliability Test Results

Variable	Cronbach's Alpha	Number of Indicators	Interpretation
Occupational Safety and Health Program (X_1)	0.655	4	Reliable
Work Discipline (X_2)	0.936	4	Reliable
Employee Productivity (Y)	0.930	4	Reliable

Sources : Research Data Processed, 2026

As reported in Table 7, all research constructs achieved acceptable reliability levels, with Cronbach's Alpha coefficients ranging from 0.655 to 0.936. These results indicate that the measurement instrument is reliable for subsequent statistical analysis (Cheung et al., 2024).

Classical Assumption Tests

Before hypothesis testing, the regression model was evaluated for normality, multicollinearity, and heteroscedasticity (Osemeke et al., 2024). The results are presented in Table 8.

Table 8
Summary of Classical Assumption Tests

Assumption Test	Criterion	Result	Conclusion
Normality	Sig. > 0.05	0.180	Passed
Multicollinearity	Tolerance > 0.10	0.903	Passed
	VIF < 10.00	1.108	Passed
Heteroscedasticity	Sig. > 0.05	0.398; 0.072	Passed

Sources : Research Data Processed, 2026

The results indicate that all classical assumptions were satisfied. The residuals were normally distributed (Kolmogorov-Smirnov, Sig. = 0.180), no multicollinearity was detected (Tolerance = 0.903; VIF = 1.108), and the Glejser test indicated no heteroscedasticity (Sig. > 0.05) (Đalić & Terzić, 2021). Therefore, the regression model was considered suitable for multiple linear regression analysis (Adhikari, 2022).

Multiple Linear Regression Analysis

To examine the proposed relationships, multiple linear regression analysis was conducted (Kurniawan et al., 2025). Table 9 provides the descriptive statistics of the study variables prior to regression analysis.

Table 9
Descriptive Statistics of the Research Variables

Variable	Mean	Standard Deviation	N
Employee Productivity (Y)	3.34	0.833	51
Occupational Safety and Health Program (X_1)	3.42	0.602	51
Work Discipline (X_2)	3.27	0.828	51

Sources : Research Data Processed, 2026

Table 9 shows that the OSH Program had the highest mean score ($M = 3.42$), followed by Employee Productivity ($M = 3.34$) and Work Discipline ($M = 3.27$). The relatively low standard deviations indicate consistent responses among respondents.

Multiple Linear Regression Model

Multiple linear regression analysis was employed to examine the effects of the Occupational Safety and Health (OSH) Program and Work Discipline on Employee Productivity while estimating the unique contribution of each predictor after controlling for the other variable (Hair et al., 2019; Iman et al., 2023). The regression results are presented in Table 10, including the estimated coefficients, standardized beta coefficients, t-statistics, and significance values for each predictor (Alamsyah et al., 2025).

Table 10
Multiple Linear Regression Results

Variable	Unstandardized Coefficient (B)	Std. Error	Standardized Beta	t-value	Sig.
Constant	0.147	0.154	—	0.956	0.344
Occupational Safety and Health Program (X_1)	-0.009	0.043	-0.006	-0.200	0.842
Work Discipline (X_2)	0.986	0.032	0.980	31.309	0.000

Dependent Variable: Employee Productivity

Sources : Research Data Processed, 2026

The estimated regression model is:

$$Y = 0.147 - 0.009X_1 + 0.986X_2$$

The regression results indicate that the Occupational Safety and Health (OSH) Program has no significant effect on Employee Productivity ($\beta = -0.006$, $p = 0.842$), whereas Work Discipline has a strong positive and significant effect ($\beta = 0.980$, $p < 0.001$).

Coefficient of Determination

The coefficient of determination (R^2) measures the proportion of variance in the dependent variable explained by the independent variables in the regression model (Xu et al., 2022). Because Adjusted R^2 provides a less biased estimate by accounting for the number of predictors and sample size, it is commonly used to evaluate the model's explanatory power (Hair et al., 2019). Table 11 presents the regression model summary, including R , R^2 , Adjusted R^2 , and the standard error of the estimate, to assess the model's explanatory power and goodness-of-fit (Chin et al., 2020).

Table 11
Results of the Coefficient of Determination Analysis

R	R Square	Adjusted R Square	Std. Error of Estimate
0.979	0.957	0.956	0.175

Sources : Research Data Processed, 2026

The regression model demonstrated strong explanatory power, with an Adjusted R^2 of 0.956, indicating that the Occupational Safety and Health (OSH) Program and Work Discipline jointly explained 95.6% of the variance in Employee Productivity.

Relative Contribution of Independent Variables

Relative contribution analysis was performed to determine the comparative importance of each independent variable in explaining Employee Productivity (Dattalo, 2013). The contribution of each predictor was estimated by combining its standardized regression coefficient (Beta) with the corresponding Pearson correlation coefficient (Data et al., 2024). This approach provides an indication of the comparative contribution of each predictor to the explained variance in Employee Productivity. Independent variables with higher positive contribution values are interpreted as having a greater influence on the dependent variable, while lower or negative contribution values indicate a relatively limited explanatory role within the regression model (Hair et al., 2019). Variables with higher contribution values were considered to have a greater explanatory role. The results are presented in Table 12.

Table 12
Relative Contribution of Independent Variables

Independent Variable	Pearson Correlation (r)	Standardized Beta	Contribution
Occupational Safety and Health Program (X_1)	0.908	-0.006	-0.005
Work Discipline (X_2)	0.955	0.980	0.936
Total Contribution			0.931

Sources : Research Data Processed, 2026

Work Discipline contributed the largest share to Employee Productivity (93.6%), while the contribution of the OSH Program was negligible and statistically insignificant.

Simultaneous Significance Test (F-test)

The Simultaneous Significance Test (F-test) was used to evaluate the overall significance of the regression model and determine whether the independent variables jointly influenced the dependent variable (Hair et al., 2019). A significance value below 0.05 indicates a statistically significant model (Franzese & Kam, 2009). The F-test results are presented in Table 13, which summarizes the ANOVA results for the regression model.

Table 13
Results of the Simultaneous Significance Test (ANOVA F-test)

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	33.250	2	16.625	540.668	0.000
Residual	1.476	48	0.031		
Total	34.726	50			

Sources : Research Data Processed, 2026

The F-test results indicate that the regression model is statistically significant ($F = 540.668$, $p < 0.001$), demonstrating that the Occupational Safety and Health (OSH) Program and Work Discipline jointly explain variations in Employee Productivity (Lari, 2024).

Hypothesis Testing (t-test)

The t-test was conducted to assess the individual effect of each independent variable on the dependent variable while controlling for the other predictors in the regression model (Hair et al., 2019). Statistical significance was determined at $p < 0.05$ (Anderson et al., 2000). The results of the t-test, together with the F-test, are presented in Table 14, including the regression coefficients, significance values, and hypothesis decisions.

Table 14
Summary of Hypothesis Testing

Hypothesis	Relationship	β	t-value	Sig.	Decision
H1	Occupational Safety and Health Program → Employee Productivity	-0.006	-0.200	0.842	Rejected
H2	Work Discipline → Employee Productivity	0.980	31.309	0.000	Supported
H3	Occupational Safety and Health Program & Work Discipline → Employee Productivity	—	F = 540.668	0.000	Supported

Sources : Research Data Processed, 2026

The hypothesis testing results show that H1 was not supported, indicating that the Occupational Safety and Health (OSH) Program had no significant effect on Employee Productivity. In contrast, H2 and H3 were supported, confirming that Work Discipline had a positive and significant effect on Employee Productivity and that the two independent variables jointly influenced Employee Productivity, with Work Discipline emerging as the dominant predictor.

The Effect of Occupational Safety and Health Program on Employee Productivity

The results indicate that the Occupational Safety and Health (OSH) Program did not significantly affect Employee Productivity ($\beta = -0.006$, $p = 0.842$), leading to the rejection of H1. Although previous studies suggest that effective OSH practices enhance productivity by improving workplace safety and reducing occupational risks (Melhem et al., 2024), this relationship was not supported in the present study.

This result can be explained by the organizational context of PT Pelabuhan Indonesia (Persero) Regional 4 Makassar. Employees perceived the company's OSH implementation positively (Mean = 3.42), and the P2K3 Quarterly Report IV (2025) documented a zero-accident record, indicating that safety management has become an established organizational practice. As safety procedures are consistently implemented, OSH functions as a basic organizational requirement rather than a factor differentiating employee productivity.

These findings indicate that the effectiveness of OSH practices in improving productivity may depend on the level of maturity and integration of the organization's safety management system (Morgado et al., 2019). In organizations with well-established safety practices, productivity improvements are more likely to be driven by behavioral factors than by additional safety interventions, extending previous studies that generally reported a positive OSH-productivity relationship.

The Effect of Work Discipline on Employee Productivity

The findings support H2, indicating that Work Discipline has a positive and significant effect on Employee Productivity ($\beta = 0.980$, $p < 0.001$). Employees who consistently

comply with organizational regulations, standard operating procedures, and operational requirements tend to perform their duties more effectively and efficiently.

The descriptive results also indicate favorable perceptions of work discipline (Mean = 3.27), particularly regarding compliance with work instructions (Mean = 3.53). Moreover, Work Discipline was found to contribute approximately 93.6% to the explained variance of Employee Productivity. This result highlights that Work Discipline serves as the primary determinant of productivity among the variables examined in the regression model (Tasya et al., 2024).

These findings are in line with previous studies demonstrating that employees with strong work discipline tend to achieve higher productivity levels through effective time management, adherence to organizational procedures, and consistent work performance (Nurhayati et al., 2025). Therefore, organizations should strengthen discipline through effective supervision, performance evaluation, leadership support, and fair reward and disciplinary systems.

The Simultaneous Effect of Occupational Safety and Health Program and Work Discipline on Employee Productivity

The findings support H3, indicating that the Occupational Safety and Health (OSH) Program and Work Discipline jointly influence Employee Productivity ($F = 540.668$, $p < 0.001$). The regression model also demonstrated strong explanatory power, with an Adjusted R^2 of 0.956, indicating that the two variables explained 95.6% of the variance in Employee Productivity (Mulroy, 2020).

However, Work Discipline emerged as the dominant predictor, while the direct effect of the OSH Program became insignificant after controlling for disciplinary behavior. This suggests that OSH provides the organizational foundation for safe operations, whereas employee discipline translates organizational systems into productive work behavior.

Although the company has successfully institutionalized occupational safety through its zero-accident performance, further productivity improvement depends primarily on strengthening employee discipline. The remaining 4.4% of unexplained variance indicates that other factors, such as leadership, motivation, organizational commitment, and organizational culture, may also influence Employee Productivity. Accordingly, future studies should incorporate these variables to provide a more comprehensive understanding of productivity determinants.

Overall, the findings highlight that sustaining effective safety management practices alongside strengthening employee discipline is crucial for maintaining operational effectiveness and achieving long-term organizational productivity.

Theoretical and Practical Implications

This study extends the literature by demonstrating that the effect of Occupational Safety and Health (OSH) programs on Employee Productivity is contingent upon the organizational context in which they are implemented (Lari, 2024). In organizations with mature safety management systems, OSH serves as a fundamental operational requirement rather than a direct productivity driver, while work discipline becomes the primary behavioral determinant of productivity (Le & Nguyen, 2025).

Practically, PT Pelabuhan Indonesia (Persero) Regional 4 Makassar should maintain its effective OSH system while strengthening employee discipline through regular supervision, performance evaluation, and compliance monitoring. These efforts

are expected to sustain safety performance and improve operational efficiency (Benson et al., 2024).

CONCLUSION AND SUGGESTION

This study found that the Occupational Safety and Health (OSH) Program did not significantly affect Employee Productivity, suggesting that in organizations with mature safety management systems, OSH serves primarily as a prerequisite for safe operations rather than a direct driver of productivity. In contrast, Work Discipline had a strong positive and significant effect, emerging as the dominant predictor of Employee Productivity. Together, both variables significantly explain Employee Productivity, with the model accounting for 95.6% of its variance. These findings emphasize that sustaining effective safety management while strengthening employee discipline is essential for improving organizational productivity.

PT Pelabuhan Indonesia (Persero) Regional 4 Makassar should continue strengthening its OSH management system while prioritizing the development of employee discipline through effective supervision, systematic performance evaluations, and transparent reward and disciplinary mechanisms.

Future research should employ larger and more diverse samples, incorporate additional determinants such as leadership, work motivation, organizational commitment, compensation, and organizational culture, and apply advanced analytical techniques, including Structural Equation Modeling (SEM) and Partial Least Squares Structural Equation Modeling (PLS-SEM), to provide a more comprehensive understanding of employee productivity.

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