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Relationship between Work Safety Facilities, Work Environment, and Employee Welfare to Employee Performance in Fabrication Sector at PT. Trim Pandu Engineering

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Abstract

This research aims to analyzed the relationship between work safety facilities, work environment, and employee welfare to employee performance in the fabrication sector at PT. Trim Pandu Engineering. Adequate work safety facilities are believed to able to create a safe work environment, thereby reducing the risk of work accidents and increasing productivity. Apart from that, employee well-being also plays an important role in maintaining job satisfaction and motivation which has impact on increasing work. The method used in this research is quantitative with a survey approach. Data collected throught cakes distributed to 82 employess of PT. Trim Pandu Engineering that work in the fabrication sector. The free variabls in this research are employee safety, work environment and employee welfare facilities, while the dependent variabel is employee performance. Data analysis was carried out using multiple linear regression tests to see the influence of the three independent variables on employee performance. The result of this research shows that employee safety, work environment, and employee welfare facilities are positively and significantly related to employee performance. Better work safety facilities have been proven to improve employee performance, as well as better employee welfare which has a significant impact on increasing productivitly and performance. This study suggest that company management should continue to improve work safety facilities and employee welfare to ensure optimal performance is achieved.

Keywords: Work Safety Facilities, Work Environment, Employee Welfare, Employee Performance

INTRODUCTION

Work safety is a key element in creating a productive work environment, especially in the manufacturing sector which is at high risk of work accidents. A comfortable work environment and guaranteed employee well-being also play an important role in encouraging optimal performance.

According to (Desler, 2020), employee well-being includes physical, mental and emotional aspects that are interrelated and have a direct impact on individual and organizational performance. In addition to workplace safety facilities, the influence of the work environment and employee welfare on employee performance.

High employee performance can make employee loyal to the organization, motivated work, so that high productivity is achieved. (Mardiani & Widiyanto, 2021) A supportive work environment can encourage innovation and motivation, while adequate work safety facilities can reduce accident rates and create a positive work culture (Auradriana et al., 2025).

PT. Trim Pandu Engineering, as a company operating in fabrication sector, realized the importance of maintaining employee safety and well-being to support achieving the company's goals. Therefore, the company has provided various workplace safety facilities and employee welfare programs. However, the effectiveness of these facilities and program is improving employee performance still needs to be researched further to ensure whether the steps taken have contributed significantly to employee performance.

PT. Trim Pandu Engineering has a business portfolio, namely engineering service which is capable of creating product with high competition, specification and system complexity starting from concept design, fabrication and site service or technician repair at the project location or workshop. The types of work carried out include welding, machining, repairs, modification, and special design and fabrication.

In this research, the author analyzes the relationship between work safety facilities, work environment, and employee welfare, on employee performance in the fabrication sector

PT. Trim Pandu Engineering. By understanding this relationship, companies are expected to be able to take more effective step to improve employee performance through improving work safety facilities and employee well-being. The relationship between ergonomics, working condition, and productivity examines how employee safety, comfort, and well-being in the workplace contribute to higher work performance (Yulianto Setyawan, 2023).

An economical work environment and adequate work safety facilities contribute significantly to increasing employee productivity and well-being. Implementation of economic principles reduces land use and increases work efficiency, while good work safety facilities reduce the rate of work accidents (Palilingan et al., 2024).

In previous research entitled : the influence of Work Environment and Work Facilities on Employee Performance Through Work Motivation at The Ajatappareng Forest Management unit (KPH) Department of the Environment and Forestry Of South Sulawesi Province, it was concluded that the work environment and work safety facilities have a significant influence on employee work performance. (Agusrianto, Ansar, 2024).

Meanwhile, in another study with the title: The Influence Of Leadership Style, Work Environment and Compensation on Employee Performance with Motivation as an Intelligence Variable, it can be concluded that leadership style, work environment and compensation have a positive influence simultaneously in employee performance. (Ayuningtias et al., 2020)

Meanwhile (Rindia et al., 2024), in his research entitled : The Influence Of Occupational Safety and Health Facilities (K3) and Non-Physical Work Environment on Employee Performance at PT. Surya Perkasa Beton. Based on result of the t-test, the work facilities variable obtained a calculated t value of $2.556 > 1.672$ t table. Therefore, H_0 is rejected and H_1 is accepted. That t value is positive and significant, which means that work facilities have an effect on employee performance. From the result on the H_1 hypothesis test, it was

obtained that work facilities (X1) have a positive and significant effect on performance (Y).

Similar things were stated by (Subhan et al., 2023), in their study entitled : The Influence Of Occupational Health Safety and Physical Work Environment on Employee Performance. The result of the study showed an influence between occupational health safety and employee performance at PT. Masadi Tatanan Kontrainer Indonesia as evidenced by the calculated t value = 0.7340 which is greater than t table value = 1.99656 and the significant value = 0.000 which is smaller than 0.05 or 5%, so H0 is rejected and Ha is accepted. This states that's occupational health safety has a positive and significant partial effect on employee performance.

In a study entitled The Influence of Work Environment, Occupational Safety and Health (K3) on Employee Performance at Oesao Health Center. The results of the study indicate that partially the work environment has a positive and significant effect on employee performance, occupational safety and health has a positive and significant effect on employee performance, and simultaneously the work environment, occupational safety and health have a positive and significant effect on employee performance. (Mooy, D., Fanggidae, R. E., Salean, D. Y., & Nursiani, N. P., 2023)

In another study entitled The Influence of Occupational Health and Safety (K3) and Work Discipline on Employee Performance of PT Kino Indonesia, Tbk Prigen Pasuruan Branch. The results of the study showed that occupational health and safety have a significant influence on employee performance of PT. Kino Indonesia, Tbk Prigen Pasuruan Branch, meaning that with better occupational health and safety facilities, employee performance will increase. (Ernawaty, S., Rachma, N., & Primanto, A. B., 2020)

Meanwhile, in a study entitled The Influence of Work Environment and Occupational Health and Safety on Employee Performance at PLN ULP Panakkukang Makassar. The results of the

study showed that of the 3 variables studied, there was 1 unrelated variable, namely work safety (p = 0.134), while the work environment variables (p = 0.000) and work health (p = 0.000) had an influence on employee performance at PT. PLN ULP Panakukkang Makassar Selatan. Companies should pay more attention to the work environment because safe and comfortable work conditions can make employees healthy and productive, the more productive employees will increase performance and high results. Occupational health needs to be considered again, especially the provision of clean water, bathrooms and providing employee health facilities. (Ilham, N., & Ikhtiar, M., 2022)

METHODS

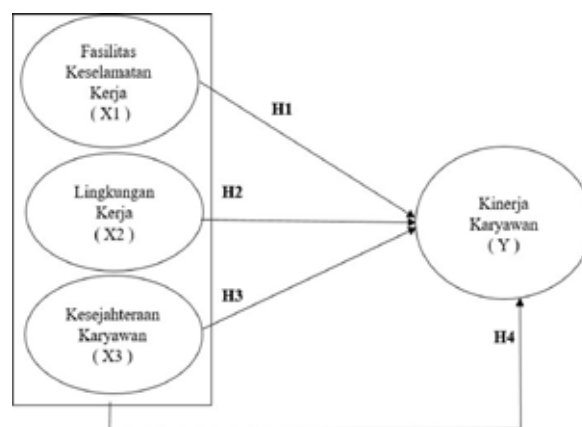


Figure 1. Research methods
Source: Researcher

In researching the relationship between work facilities, work environment, and employee welfare, on employee performance in the fabrication sector of PT. Trim Pandu Engineering, the author use quantitative methods.

According to (Sugiyono, 2019), quantitative data is data in the form of numbers or data that can be qualified. This data usually obtained from the result of measurements that use scales, such as nominal, ordinal, interval and ratio scales. This methods has been used for long time so that it has become a tradition as a method for research because by using this method various new

sciences and technology can be discovered and developed. This method is called a quantitative method because the research data is in the form of numbers and the analysis uses statistics.

Meanwhile, the data analysis used in this study includes normality test, multicollinearity test, heteroscedasticity test, multiple linear regression result, t-test (partial test), f-test (simultaneous), and coefficient of determinant tests.

RESULTS

Normality test

The normality test is carried out with the aim of testing whether in the regression mode, the variables with the dependent and the independent have a normal distribution or not. A good regression mode is one that has a normal or close to normal data distribution. To test whether the data distribution is normal or not, researchers use the one-sample kolmogrov-smirnov test, the histogram test, and the P-Plot graph normality test. Normality test result can be seen in Table 1.

Based on the table 1 above, it shows that the significant value result is 0.063 which is greater than 0.05, so the residual value can be said to be normal. So it can be concluded that the data from the variables of Work Facilities (X1), Work Environment (X2), Employee Welfare (X3) towards Employee Performance (Y) in this case are normally distributed.

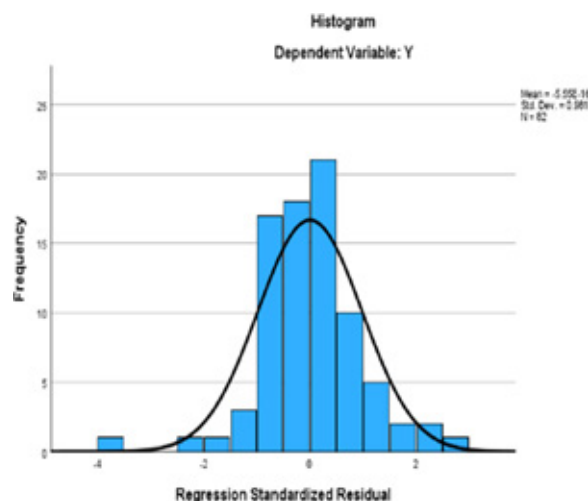


Figure 2. Histogram graph
Source: Result of SPSS version 30 data processing.

Table 1. Result of the kolmogrov-smirnov normality test

One-Sample Kolmogorov-Smirnov Test	
	Unstandardized Residual
N	82
Mean	.0000000
Std. Deviation	3.53147195
Absolute	.095
Positive	.095
Negative	-.090
Test Statistic	.095
Asymp. Sig. (2-tailed)	.063

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 2000000.

Source: Result of SPSS version 30 data processing.

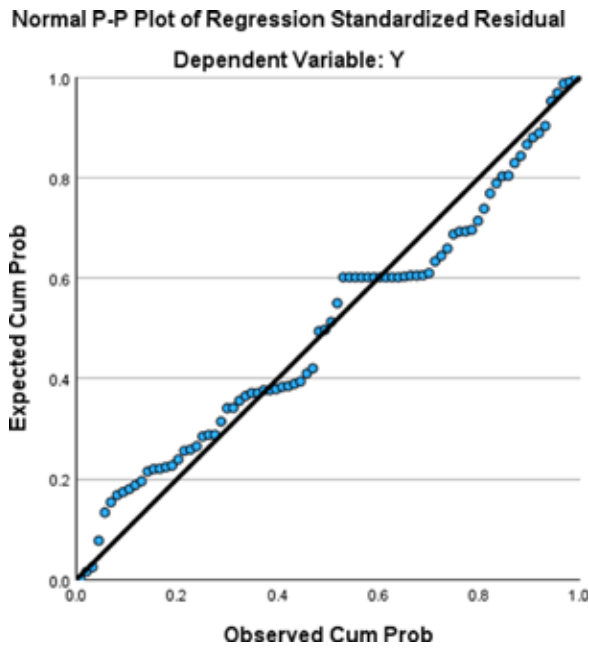


Figure 3. P-plot

Source: Result of SPSS version 30 data processing.

Based on the appearance of figure 2 above, it is known that the graph forms a mountain or bell. Meanwhile, based on Figure 3 above, it can be seen that the p-plot graph shows that the point are around the diagonal line, so it can be concluded that this regression model meets the assumption of normality even though there is a slight deviation. In other words, it can be said that the data from all samples in this study are normally distributed.

Multicollinearity test

Multicollinearity test is used to test whether the model in the regression is found to have correlation between independent variables. A good regression model should not have correlation between independent variables. To detect whether or not there is multicollinearity in the regression, it can be done by looking at the Tolerance value and the Variance Inflation Factor (VIF) value. If the tolerance value is > 0.10 and the VIF value < 10 , then there is no multicollinearity problem. The results of the multicollinearity test are as in the table 2.

Table 2. Result of multicollinearity test

	Unstandardized Coefficients		Coefficients ^a Standardized Coefficients			Collinearity Statistics	
	B	Std. Error		Beta		Tolerance	VIF
(Constant)	9.630	2.927		3.290	.002		
Work Safety Facilities	.030	.125	.030	.239	.812	.283	3.539
Work Environment	.740	.136	.773	5.439	<.001	.213	4.690
Employee Welfare	.875	.166	.932	5.271	<.001	.157	6.365

a. Dependent Variable: Employee Performance

Source: Result of SPSS version 30 data processing.

Based on the result of the multicollinearity table. The VIF result are 3.539; 4.690; and 6.365 < 10 then there are no symptoms of multicollinearity.

Heteroscedasticity test

A good regression model is one that is homoscedastic or does not have heteroscedasticity, which will be indicated by the regression coefficient of the independent variable to the absolute value of its residual (t). If the probability value is greater than alpha ($\alpha=0.05$), then it is certain that the model does not contain elements of heteroscedasticity. If the correlation value is less than alpha, then the regression model experiences heteroscedasticity.

Based on the result of the table above, the result shows that the significant value of heteroscedasticity of the Work Safety Facility variable (X1) is 0.006 < 0.05, then the Work Safety Facility variable shows symptoms of heteroscedasticity. The Work Environment variable (X2) is 0.004 < 0.05, then

the Work Environment variable shows symptoms of heteroscedasticity. The Employee Welfare variable (X3) is 0.011 > 0.05, then the Employee Welfare variable does not show symptoms of heteroscedasticity.

Multiple linear regression result

Multiple line analysis is carried out to determine the influence between three individual variables with one variable with one variable displayed in the form of a regression equation. The multiple linear regression equation is as follows.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3$$

Description :

Y = Employee Performance Variables
 X1 = Job Safety Facilities Variables
 X2 = Work Environment Variables
 X3 = Employee Welfare Variables

A = Constant value (Y' value if X₁, X₂, X₃,..... X_n = 0)

b₁, b₂, b₃ = coefficient value of regression (value of increase or decrease)
 e = Error

Table 3. Result of heteroscedasticity test

	Coefficients ^a				
	Unstandardized Coefficients		Standardized Coefficients Beta		
	B	Std. Error			
(Constant)	8.422	1.627		5.177	<.001
Work Safety Facilities	.196	.070	.492	2.811	.006
Work Environment	-.224	.076	-.597	-2.964	.004
Employee Welfare	-.113	.043	-.360	-2.612	.011

a. Dependent Variable: ABS_RES

Source: Result of SPSS version 30 data processing.

Table 4. Result of multiple linear analysis

	Coefficients ^a				
	Unstandardized Coefficients		Standardized Coefficients Beta		
	B	Std. Error			
(Constant)	8.422	1.627		5.177	<.001
Work Safety Facilities	.196	.070	.492	2.811	.006
Work Environment	-.224	.076	-.597	-2.964	.004
Employee Welfare	-.113	.043	-.360	-2.612	.011

a. Dependent Variable: Employee Performance

Source: Result of SPSS version 30 data processing.

Based on result of the above, it can be seen that the value of the coefficient of economics and the variable of employee welfare facilities is 0.030, the variable of work environment is 0.740, and the variable of employee welfare is 0.019 with a constant of 9.630, the conclusion the table above is as follows:

1. The constant value of 9.630 is not interpreted because the variable of Work Safety Facilities, Work Environment, and Employee Welfare cannot possibly have a value of 0, meaning that if the values of Work Safety Facilities, Work Environment, and Employee Welfare are 0, then the value of Employee Performance (Y) is 9.630.
2. The value of the coefficient of performance for the variable Job Safety Facility (X1) is 0.030, meaning that if the Job Safety Facilities (X1) experiences of one unit, the Employee Performance (Y) will experience and increase of 0.030 units with the assumption other independent variables have fixed values. On the other hand, a one-unit decrease in the Job Safety Facility variable (X1) will reduce Employee Performance (Y) by 0.030 with the other units remaining constant.

3. The value of the coefficient of efficiency in the Work Environment (X2) is 0.740, meaning that if the Work Environment (X1) experience an increase of one unit, than Employee Performance (Y) will experience an increase of 0.740 units assuming other variables has a fixed value. On the other hand, a one-unit decrease in the Work Environment variable (X2) will reduce Employee Performance (Y) by 0.740 with the other units remaining constant.
4. The value of the coefficient of efficiency for Employee Welfare (X3) is 0.019 units, if Employee Welfare (X3) increase by one unit, than the Employee Performance (Y) will increase 0.019 units assuming the variable other independent has a fixed value. On the other hand, a one-unit decrease in the Employee Welfare variable (X3) will reduce Employee Performance (Y) by 0.019 with the other units remaining constant.

Coefficient of determination test

Determination coefficient test (R²) is a test carried out to find out how big the independent variables are able to explain and influence the independent variables. The following are the result of the determination test.

Table 5. Result of coefficient of determination test

Model Summary^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.815a	.664	.652	3.59874	2.353

a. Predictors: (Constant), Employee Welfare, Work Safety Facilities, Work Environment
b. Dependent Variable: Employee Performance

Source: Result of SPSS version 30 data processing.

Based on the table above regarding the result of the determinant coefficient test, it can be seen that the value of R square is 0.652. This means that 65.2% of employee performance is influenced by three variables: Job Safety Facilities, Work Environment, and Employee Welfare. Meanwhile the remaining 34.8% (100% - 65.2%) is influenced by other variables such as Job Facilities, Work Environment, and Employee Welfare.

t-test (partial test)

The t test is known as a partial test, which is to test how each variable independently influences the dependent variables. This t test can be done by

comparing the t count with the t table or looking at the significant column in each t count. The t test was carried out to determine the influence of the individual variables on the partial variables. The analysis uses a significance level of $0.05:2 = 0.025$, and degrees of freedom ($df = n - k - 1$), so $df = 82 - 4 - 1 = 77$ and the t table of 1.991 is obtained.

1. $t \text{ count} > t \text{ table}$, then H_a is accepted, which means that each individual variable has a partial influence on the dependent variable.
2. $t \text{ count} < t \text{ table}$, the H_a is rejected, which means that each individual variable partially has no influence on the dependent variable.

Table 6. Result of t-test

	Coefficients^a				
	Unstandardized Coefficients		Standardized Coefficients Beta		
	B	Std. Error			
(Constant)	9.630	2.927		3.290	.002
Work Safety Facilities	.030	.125	.030	.239	.812
Work Environment	.740	.136	.773	5.439	<.001
Employee Welfare	.875	.166	.932	5.271	<.001

a. Dependent Variable: Employee Performance

Source: Result of SPSS version 30 data processing.

1. Testing the first hypothesis (H1)

It is known that the sig. The effect of Job Safety Facilities (X1) on Employee Performance (Y) is $0.812 > 0.05$. Because the sig. > 0.05 then the Zero Hypothesis (H0) is accepted. The the calculated t value is $0.239 < t \text{ table } 1.991$, so it can be concluded that the Job Safety Facilities (X1) do not have a significant influence on Employee Performance (Y).

2. Testing the second hypothesis (H2)

It is known that the sig. for the influence of the Work Environment (X2) on Employee Performance (Y) is as large as $0.001 < 0.05$. Because the value of sig. < 0.05 then the Zero Hypothesis (H0) is not accepted. Then the calculate t value is $5.439 > t \text{ table } 1.991$, so it can be concluded that the Work Environment (X2) has a significant influence on Employee Performance (Y).

3. Testing third hypothesis (X3)

It is know that the sig. for the influence of the Employee Welfare (X3) on Employee Performance (Y) is as large as $0.001 < 0.05$. Because the value of sig. < 0.05 then the Zero Hypothesis (H0) is not accepted. Then the calculated t value is $5.271 > t \text{ table } 1.991$, so it can be concluded that Employee Welfare (X3) has a significant effect on Employee Performance (Y).

F test (simultaneous)

The f test is used to determine the influence of various variables, namely Job Safety Facilities (X1), Work Environment (X2), Employee Welfare (X3) which simultaneously influence the variables related to Employee Performance (Y).

The hypothesis proposed is as follow:

$H_0 b_1 = 0$, meaning there is no simultaneous influence between Work Safety Facilities (X1), Work Environment (X2), and Employee Welfare (X3) on Employee Performance (Y).

$H_a b_1 \neq 0$, meaning there is a simultaneous influence between Work Safety Facilities (X1), Work Environment (X2), and Employee Welfare (X3) on Employee Performance (Y).

Criteria used:

1. If the probability < 0.05 then H1 is accepted.
2. If the probability > 0.05 then H0 is rejected.
3. If $f_{\text{count}} > f_{\text{table}}$, then H_a is accepted, meaning that each of the independent variables together have a significant influence on the dependent variables.
4. If $f_{\text{count}} < f_{\text{table}}$, then H_a is rejected, meaning that each variables of independent together does not have a significant influence on the variables of dependent.

$F_{\text{table}} = F(k:n-k) = F(4 : 78) = 2.489$

Table 17. Result of simultaneous test (f test)

ANOVAa					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2000.423	3	666.808	51.487	<.001b
Residual	1010.175	78	12.951		
Total	3010.598	81			

a. Dependent Variable: Employee Performance

b. Predictors: (Constant), Employee Welfare, Work Safety Facilities, Work Environment

Source: Result of SPSS version 30 data processing.

Based on the result of ANOVA or f test in the table, it is obtained f with the level of calculated f result = 51.487 with a significant of < 0.001 using a significant limit of 0.05, the f table value of 2.489 was found, this means that the calculated $f > f$ table value and the significant value of $0.001 < 0.05$, this value determines whether a hypothesis is accepted or rejected. It is said to be accepted if it is below 0.05.

Thus, it can be concluded that there is an influence between Work Safety Facilities (X1), Work Environment (X2), and Employee Welfare (X3) on Employee Performance (Y), each independent variable both has a significant influence on the dependent variables (Employee Performance) and means that H_0 is rejected and H_a is accepted.

DISCUSSION

The influence of work safety facilities on employee performance

Based on the test result that have been conducted above regarding the influence of Work Safety Facilities (X1) on Employee Performance (Y), the calculated t value is 0.239 with a significant level of 0.812. Because the significance value is greater than 0.05 (Sig > 0.05), the Zero hypothesis (H_0) is accepted. This indicates that the work safety facilities variable does not have a significant influence on employee performance. The first hypothesis stating that work safety facilities have a positive influence on employee performance is not proven to be true.

The influence of work environment on employee performance

Based on the test result that have been conducted above regarding the influence of Work Environment (X2) on Employee Performance (Y), the calculated t value is 5.439 with a significant level of 0.001. Because the significance value is smaller than 0.05 (Sig. < 0.05), the Zero hypothesis (H_0) is rejected. This indicates that the work environment variables has a significant influence on employee performance. The second hypothesis which states that the work environment has a positive influence on employee performance is proven to be true.

The influence of employee welfare on employee performance

Based on the test result that have been conducted above regarding the influence of Employee Welfare (X3) on Employee Performance (Y), the calculated t value is 5.271 with a significant level of 0.001. Because the significance value is smaller than 0.05 (Sig. < 0.05), the Zero hypothesis (H_0) is rejected. This indicates that the employee welfare variables has a significant influence on employee performance. The third hypothesis which states that employee welfare has a positive influence on employee performance has been proven to be true.

The influence of work safety facilities, work environment, employee welfare on employee performance

Based on the result simultaneous testing (f test) that has been carried out above, there is a simultaneous influence of the variables of work safety facilities, work environment, and employee welfare on employee performance which is indicated by the calculated $f > f$ table value and a significance value of $0.001 < 0.05$. The calculated f value is 51.487 and sig. 0.001, meaning that there is a simultaneous or joint influence of work safety facilities, work environment, and employee welfare on employee performance. Therefore, the fourth hypothesis which states that work safety facilities, work environment and employee welfare have a positive influence on employee performance is proven to be true. This shows that work safety facilities, work environment, and employee welfare improve employee performance.

CONCLUSION

The work safety facilities variable is stated to have no positive and significant influence on the employee performance variable. The hypothesis in this study is accepted because it is based on the result of the t-statistic test using SPSS version 30. From these result it can be concluded that the work safety facilities does not have a partial effect on employee performance.

The work environment variable is stated to have a positive and significant influence on the employee performance variable. The hypothesis in this study is accepted because it is based on the result of the t- statistic test using SPSS version 30. From these results it can be concluded that the work environment partially influences employee performance.

The employee welfare variable is stated to have a positive and significant influence on the employee performance variable. The hypothesis in this study is accepted because it is based on the result of the t- statistic test using SPSS version 30. From these results it can be concluded that the employee welfare partially influences employee performance.

Simultaneously, work safety facilities, work environment, and employee welfare have a positive and significant influence on employee performance. The result of the f test shows that even though some variables do not have a partial effect, when the combination of these three factors plays a role in determining employee performance as a whole.

Based on the result of the determination test (R square) which shows that the variables of work safety facilities, work environment, and employee welfare have an influence on employee performance. However, the R Square value also indicates that there are other variables not included in this study that may affect employee performance. Therefore, future research is recommended to consider additional factors such as leadership style, work motivation, work discipline, training and human resource development, as well as work-life balance, as these variables may also contribute significantly to improving employee performance. Suggestions for the future researchers include expanding this study by incorporating additional variables that may influence employee performance, such as work motivation, job satisfaction, or leadership style, to provide a more comprehensive analysis. Furthermore, it is recommended to broaden the research scope to other companies within the same industrial sector to obtain more generalizable and comparable results.

The use of mixed methods, combining quantitative and qualitative approaches, can also be considered to gain deeper insight through interviews or observations, not just statistical data. Additionally, future researchers are advised to utilize more diverse and standardized data collection instruments and to include objective performance indicators—such as productivity data or target achievement records—to ensure the accuracy and real-world relevance of the findings.

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