ANALYSIS OF THE INFLUENCE OF OSH KNOWLEDGE AND WORK EXPERIENCE ON UNSAFE ACTIONS

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Abstrak

Keselamatan pekerja adalah faktor penting dalam keberhasilan sebuah proyek konstruksi. Tindakan tidak aman yang sering dilakukan oleh pekerja itu sendiri merupakan kontributor terbesar terhadap kecelakaan ini. Kurangnya pengetahuan K3 dan pengalaman kerja adalah penyebab utama dari tindakan tidak aman ini. Analisis penelitian ini menggunakan metode semi-kuantitatif dengan dua metode, yaitu wawancara dan analisis data. Penelitian ini melibatkan sampel sebanyak 25 individu. Data dikumpulkan melalui kuesioner dan dianalisis menggunakan regresi linier berganda, dengan pengujian hipotesis dilakukan dengan uji F dan uji t. Temuan menunjukkan bahwa uji F dari pengetahuan K3 dan pengalaman kerja secara bersama-sama berpengaruh signifikan terhadap tindakan tidak aman di kalangan pekerja. Berdasarkan uji t, ditemukan bahwa pengetahuan K3 secara individu memiliki nilai signifikan terhadap tindakan tidak aman, dan pengalaman kerja juga memiliki nilai signifikan terhadap tindakan tidak aman di kalangan pekerja. Perusahaan harus memastikan bahwa pekerja memiliki pengetahuan K3 dan pengalaman kerja karena hal ini dapat mencegah tindakan tidak aman yang dapat menyebabkan kecelakaan di tempat kerja.

Kata Kunci: pengetahuan K3, pengalaman kerja, tindakan tidak aman

Abstract

Worker safety is a crucial factor in the success of a construction project. Unsafe actions frequently carried out by the workers themselves, are the most significant contributors to these accidents. Insufficient OSH knowledge and work experience are the main causes of these unsafe actions. Analyzing this research using semi-quantitative were used 2 methods, namely interviews and also analyzing data. The study included a sample of 25 individuals. Data were collected through questionnaires and analyzed using multiple linear regression, with hypothesis testing conducted with F tests and t tests. The findings showed that the F test of OSH knowledge and work experience together significantly influence unsafe actions among workers. Based on the t test, it was found that OSH knowledge individually has a significant value on unsafe actions, and work experience also has a significant value on unsafe actions among workers. The company should ensure that workers possess OSH knowledge and work experience as these can prevent unsafe actions that may lead to workplace accidents.

Keywords: OSH knowledge, work experience, unsafe actions

1. INTRODUCTION

The construction sector is one of the largest and most hazardous industries globally, involving dangerous equipment and substances that affect worker health and safety. The International Labour Organization (ILO) reports that a worker dies every 15 seconds from work-related accidents, while 160 individuals are affected by work-related illnesses. Additionally, there are 2 million deaths each year due to occupational incidents (ILO, 2013). Accidents in the construction sector are mainly attributed to unsafe actions and conditions. Unsafe acts, often performed by the workers themselves, contribute most significantly to these accidents. Therefore, it is crucial to understand and mitigate both unsafe acts and conditions to enhance workplace safety. Efforts to improve safety include raising awareness, enforcing compliance with safety procedures, and training workers to recognize and address hazards (Septiana et al., 2014).

In Indonesia, workplace accidents have remained high, with significant increases observed from 2011 to 2014. The highest number of accidents was recorded in 2013, with 35,917 cases. Contributing factors include human error, lack of discipline, equipment issues, and poor working conditions (Primadi, 2018). The Occupational Safety and Health Management System (OSH) is a critical component of workplace safety, aimed at managing and mitigating risks associated with work activities. This system encompasses organizational structure, planning, responsibilities, execution, procedures, and resources necessary for developing, implementing, and maintaining safety policies, ultimately promoting a safe and productive work environment (Presiden RI, 2012).

Knowledge of safety and health is vital for workers to recognize workplace hazards and prevent accidents caused by unsafe actions. Lack of safety knowledge, skills, and risky behaviours are primary causes of such unsafe actions (Syaputra, 2017). Work experience is another crucial factor, as it reflects the level of knowledge and skills acquired over time, enhancing performance and safety awareness. Experience is a valuable teacher, allowing individuals to learn and improve from past activities (Maddepunggeng & Abdullah, 2016). To enhance awareness and safety in construction projects, it is crucial to study how OSH knowledge and work experience impact unsafe actions. This research seeks to inform construction practices and create a safer working environment.

2. METHOD

The location of this research is the Elevated Railway Construction Project Between Solo Balapan-Kadipiro at Suarakarta, Central Java, Surakarta. As shown in Figure 1, it will be carried out in 18 March 2024 with the contractor, namely PT. WIKA BKU-KSO.

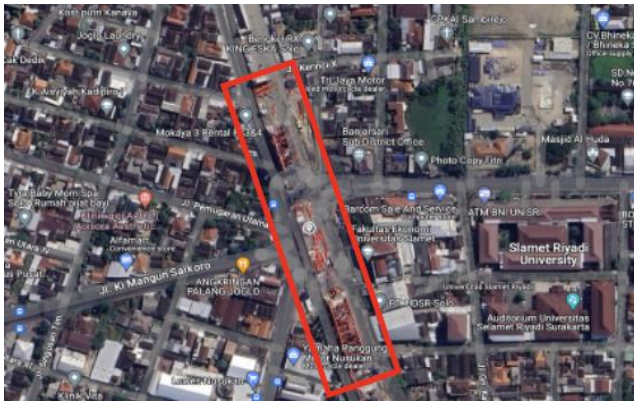
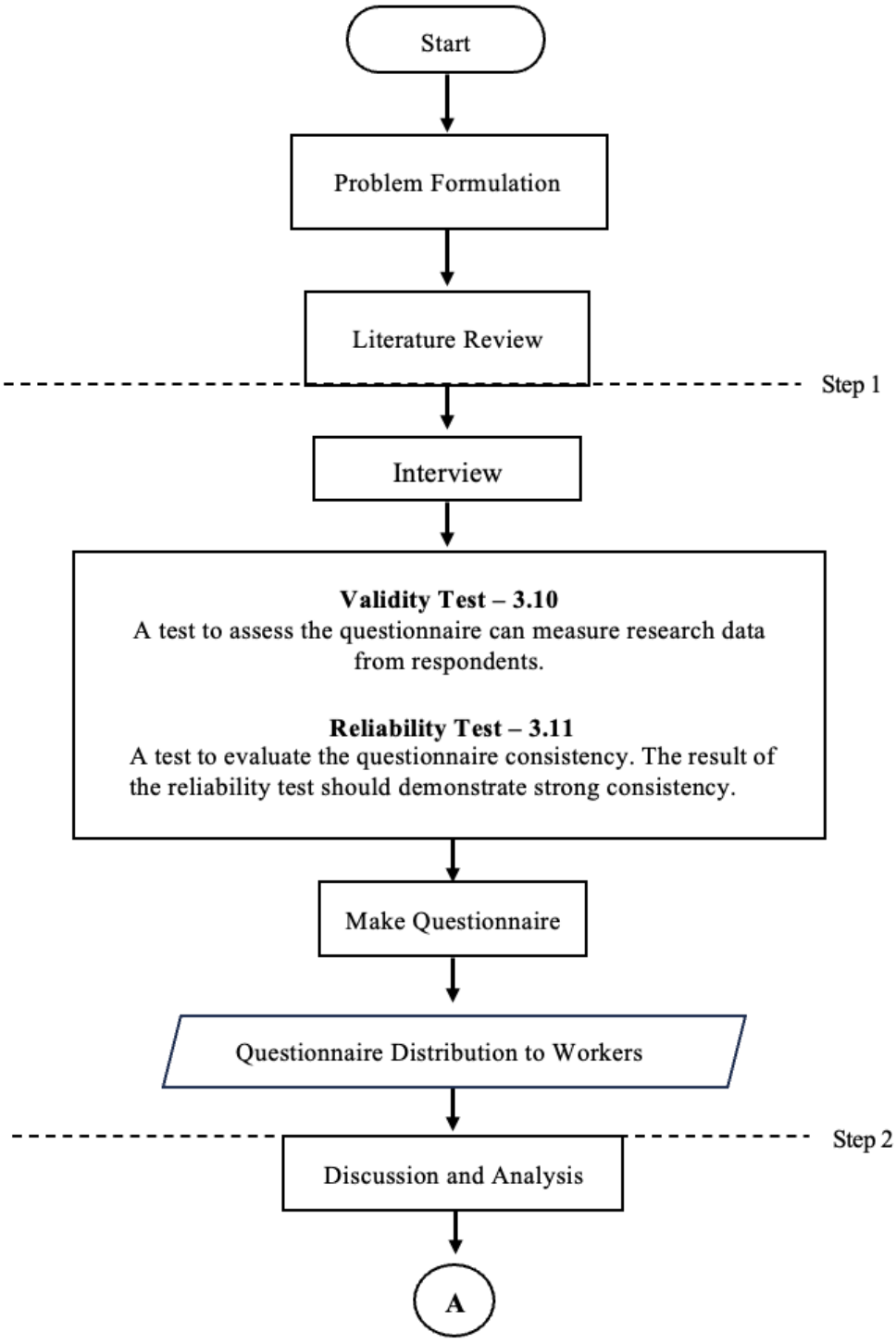


Figure 1. Project Location
(Source: Google Maps)

This research employs a semi-quantitative method, combining quantifiable data with interviews of SMK3 management to address the research questions. The flow chart outlining the research process is shown in Figure 2 below:



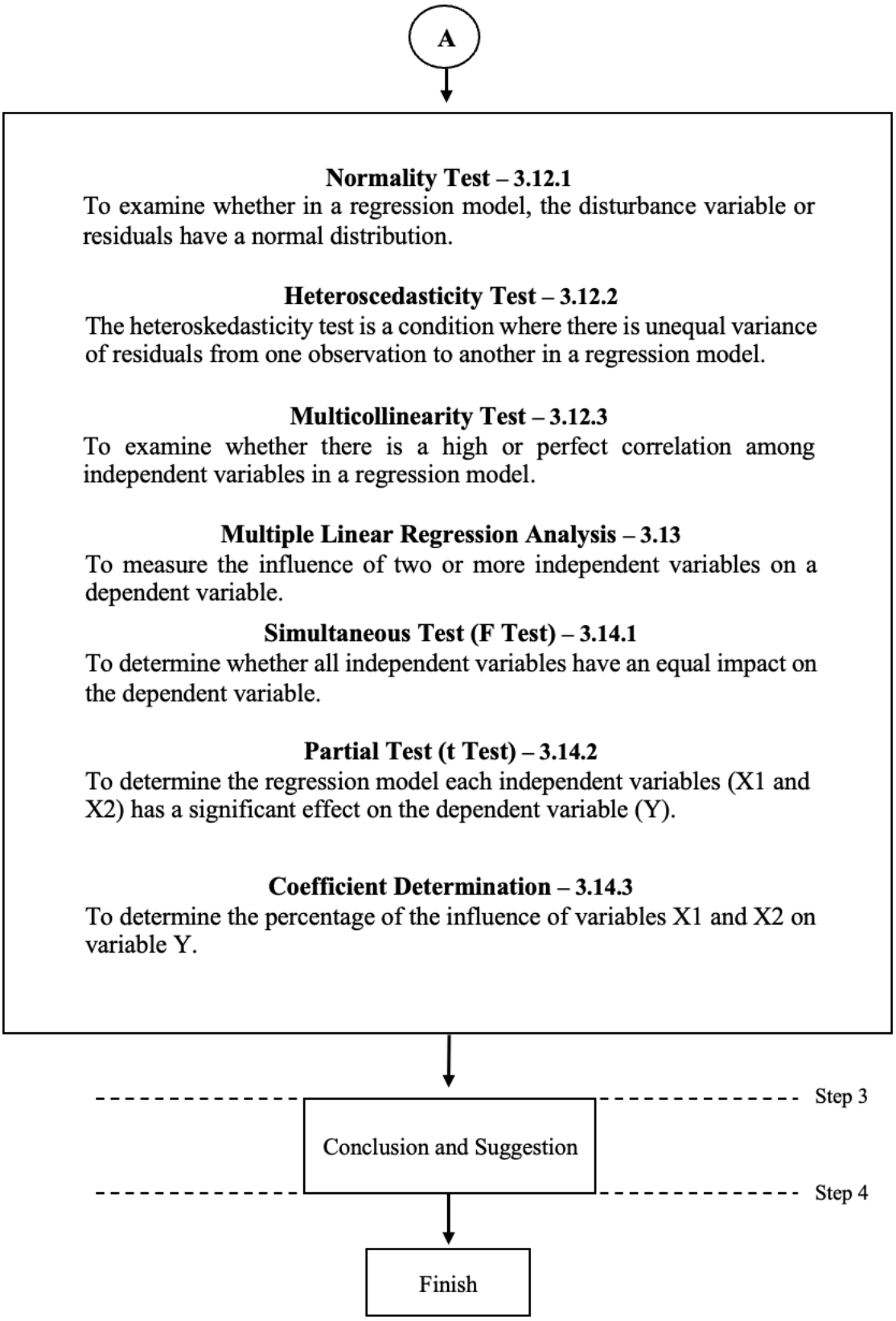


Figure 2. Research Flowchart

The flow chart above explains the research stages. Reading through previous literary reviews is the first step. After that, gather primary data through project side interviews and secondary data from Ministerial Regulation Number 50 of 2012 on the Implementation of the Occupational Safety and Health Management System. Law of the Republic of Indonesia Number 1 of 1970 on Work Safety, journals, books, and articles. The following procedure should be used to examine thecollected data used 2 methods which will be explained below:

1. Interview

The interview with the workers will be unstructured and informal, starting with broad questions related to the research area. It will generally follow a list of key topics or an agenda but will not include predetermined questions except for those used in initial interviews.

2. Analysis Data

The data obtained will be analyzed using SPSS V.29 Software.

a. Instrument Test
    1) Validity Test
    2) Reliability Test

b. Classical Assumption Test
    1) Normality Test
    2) Multicollinearity Test
    3) Heteroskedasticity Test

c. Multiple Regression Analysis

d. Hypothesis Test
    1) F Test
    2) t Test
    3) Coefficient Determination (R^2)

3. RESULT AND DISCUSSION

This research is a semi-qualitative study in which the research instruments include interview and questionnaire. The results of the interviews and the data analysis from the questionnaire will be discussed in this subsection

3.1 Instrument Test

Research instruments involve the selection or development of appropriate methods and measurement tools to substantiate the hypothesis (Setiana, 2021).

3.1.1 Interview

The result of conducting an interview with a safety management representative on the project, it can be concluded that OSH (Occupational Safety and Health) knowledge and work experience have an impact on the unsafe actions of workers in the field. OSH knowledge makes workers more mindful of their safety while working on site. Workers will be equipped with safety knowledge and training, enabling them to anticipate accidents and prevent unsafe actions that may lead to accidents in the field. Similarly, work experience provides workers with the knowledge of potential causes of workplace accidents and how to prevent them. Experienced workers possess greater skills compared to those who are just starting their careers.

3.1.2 Questionnaires

3.1.2.1 Validity Test

The initial examination involved validating the questionnaire to assess its accuracy. Two validity tests were conducted. The first test revealed that several items were invalid as measuring instruments. According to Jaya (2019), invalid items should be eliminated from the questionnaire. Table 1. shows the results of the validity test before correction.

Table 1. The Validity Test Result Before Eliminations

Variable	r count	Significant	r table	Description
OSH Knowledge (X1)	0,821	0,05	0,706	Valid
	-0,315	0,05	0,706	Not Valid
	0,972	0,05	0,706	Valid
	0,972	0,05	0,706	Valid
	0,821	0,05	0,706	Valid
	-0,041	0,05	0,706	Not Valid
	0,795	0,05	0,706	Valid
	0,734	0,05	0,706	Valid
	0,821	0,05	0,706	Valid
	0,972	0,05	0,706	Valid
Work Experience (X2)	0,972	0,05	0,706	Valid
	0,826	0,05	0,706	Valid
	0,972	0,05	0,706	Valid
	0,795	0,05	0,706	Valid
	0,826	0,05	0,706	Valid
	0,715	0,05	0,706	Valid
	0,821	0,05	0,706	Valid
	0,715	0,05	0,706	Valid
Unsafe Actions (Y)	0,795	0,05	0,706	Valid
	0,826	0,05	0,706	Valid
	0,795	0,05	0,706	Valid
	0,826	0,05	0,706	Valid
	0,734	0,05	0,706	Valid
	0,821	0,05	0,706	Valid
	0,972	0,05	0,706	Valid
	0,826	0,05	0,706	Valid

Source: Primary data processed in 2024

After eliminating the invalid items, a second validity test was conducted with a sample size of 25. The criterion for validity was r count > r table, with df = 23 and a significance level of 5%, resulting in an r table r value of 0.396. Table 2. shows the results of the validity analysis using SPSS v29 Software.

Table 1. The Validity Test Result After Eliminations

Variable	Sub-variable	r count	Significant	r table	Description
OSH Knowledge (X1)	X1.1	0,565	0,05	0,396	Valid
	X1.2	0,619	0,05	0,396	Valid
	X1.3	0,674	0,05	0,396	Valid
	X1.4	0,611	0,05	0,396	Valid
	X1.5	0,444	0,05	0,396	Valid
	X1.6	0,523	0,05	0,396	Valid
	X1.7	0,621	0,05	0,396	Valid
	X1.8	0,670	0,05	0,396	Valid
Work Experience (X2)	X2.1	0,464	0,05	0,396	Valid

	X2.2	0,587	0,05	0,396	Valid
	X2.3	0,592	0,05	0,396	Valid
	X2.4	0,529	0,05	0,396	Valid
	X2.5	0,588	0,05	0,396	Valid
	X2.6	0,408	0,05	0,396	Valid
	X2.7	0,415	0,05	0,396	Valid
	X2.8	0,450	0,05	0,396	Valid
Unsafe Actions (Y)	Y.1	0,450	0,05	0,396	Valid
	Y.2	0,410	0,05	0,396	Valid
	Y.3	0,443	0,05	0,396	Valid
	Y.4	0,674	0,05	0,396	Valid
	Y.5	0,523	0,05	0,396	Valid
	Y.6	0,658	0,05	0,396	Valid
	Y.7	0,674	0,05	0,396	Valid
	Y.8	0,558	0,05	0,396	Valid

Source: Primary data processed in 2024

3.1.2.2 Reliability Test

Reliability test assesses whether repeated measurements of the same object yield consistent results. Cronbach's alpha is commonly used for this purpose, with a value > 0.6 indicating good reliability Table 3. shows the reliability test before eliminations and Table 4. shows the reliability test after eliminations.

Table 3. The Reliability Test Results Before Eliminations

Reliability Statistics		
Cronbach's Alpha	N for items	Description
0.971	26	Reliable

Source: Primary data processed in 2024

Table 4. The Reliability Test Results After Eliminations

Reliability Statistics		
Cronbach's Alpha	N for items	Description
0.895	24	Reliable

Source: Primary data processed in 2024

3.2 Classical Assumption Test

3.2.1 Normality Test

The normality test plans to look at whether the unsettling influence or lingering factors in the relapse model have a typical dissemination. Table 5. shows the consequence of normalitiy test.

Table 5. The Result of Normality Test

	Kolmogorov-Smirnov[a]			Shapiro -Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.147	25	.170	.951	25	.260

Source: Primary data processed in 2024

Residuals are considered normally distributed if the sig value > 0.05. Conversely, if the sig value < 0.05, indicating that the residual values are not normally distributed. According to Kolmogorov-Smirnov test table above, the significance value for the residuals is 0.170, which is greater than 0.05. This indicates that the residuals are normal.

3.2.2 Multicollinearity Test

The goal of the multicollinearity test is to identify whether there is any correlation among OSH Knowledge and Work experience. Table 6 presents the results of this test.

Table 6. The Result of Multicollinearity Test

Variable	Collinearity Statistics		Description
	Tolerance	VIF	
OSH Knowledge	0.705	1.418	Multicollinearity Free
Work Experience	0.705	1.418	Multicollinearity Free

Source: Primary data processed in 2024

In light of the examination of Table 6 above, it is known that both independent variables have Tolerance values > 0.10 and VIF < 10. Therefore, it tends to be presumed that no multicollinearity exists among the independent variables (OSH knowledge and work experience). This means that in this regression model, the multicollinearity test is passed.

3.2.3 Heteroskedasticity Test

Heteroskedasticity testing assesses whether the residuals in a regression model have unequal variance. The Glejser test accomplishes this by regressing the absolute values of the residuals against the independent variable. If p-value > 0.05 indicates the absence of heteroskedasticity, while a p-value < 0.05 signifies its presence. Table 7 displays the results of the heteroskedasticity test.

Table 7. The Result of Heteroskedasticity Test

Variable	Sig (P value)	Conclusion
OSH Knowledge	0.846	Heteroskedasticity Free
Work Experience	0.203	Heteroskedasticity Free

Source: Primary data processed in 2024

The analysis results in Table 7 indicate that the p-values for the OSH knowledge variable (0.846 > 0.05) and work experience variable (0.203 > 0.05). Based on these calculations, there is no heteroskedasticity present in any of the variables.

3.3 Hypothesis Test

3.3.1 Multiple Linear Regression Test

The purpose of the multiple linear regression test is to measure the influence of the OSH Knowledge and Work Experience. The multiple regression equation is as follows:

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + e \ldots\ldots$$

Description:

Y : Unsafe Actions

α : Regressive Coefficient (Constant)

β : Regression Coefficient

X1 : OSH Knowledge

X2 : Work Experience

e : Error

Table 8. The Result of Multiple Regression

Variable	Unstandardized Coefficients	
	B	Std. Error
(Constant)	3.554	2.695
OSH Knowledge (X1)	0.443	0.085
Work Experience (X2)	0.445	0.104

Source: Primary data processed in 2024

Based on the results of the multiple linear regression test from Table 8. above, you can see the regression equation in column B. This column represents the regression coefficient for each variable, which is then incorporated into the regression equation, as follows:

$\hat{Y} = Y + X1 + X2 + e$

$\hat{Y} = 3.554 + 0.443X1 + 0.445X2$

From the equation above, the following are the implementations results:

a. The constant of 3.554 indicates that the number of unsafe actions committed by PT employees is 0, if the variables OSH knowledge (X1) and work experience (X2) are both 0. The WIKA BKU-KSO ratio is 3.554.
b. The variable OSH knowledge coefficient of 0.443 reveals that when both OSH knowledge (X1) and work experience (X2) are equal to 0, an increase in OSH knowledge by one unit will lead to an increase of 0.443 in unsafe actions. So, the OSH knowledge variable is positively associated with unsafe actions by employees at PT. WIKA BKU – KSO.
c. The coefficient for the work experience variable of 0.445 suggests that when both OSH knowledge (X1) and work experience (X2) are equivalent to 0, an expansion in work experience by one unit will bring about an increment of 0.445 on unsafe actions. As a result, employees unsafe actions at PT. WIKA BKU - KSO. is positively correlated with the work experience variable.

From the above multiple linear regression analysis results, it can be inferred that the work experience variable (X2) has the most dominant influence on unsafe actions (Y). This is because its regression coefficient has the highest value among the other variables, which is 0.445.

3.3.2 F Test

The F-test is useful for determining the significance of the simultaneous influence of the variables OSH knowledge (X1) and work experience (X2) on unsafe actions (Y). Table 9. shows the result of F test.

Table 9. The Result of F Test

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	90.094	2	45.047	49.389	< 0.001
Residual	20.066	22	0.912		
Total	110.160	24			

Source: Primary data processed in 2024

In light of the examination above utilizing the SPSS program, the obtained $F_{calculate} > F_{table}$ (49.389 > 3.443) with a significance level of < 0.001 < 0.05. Therefore, the invalid speculation (Ho) is dismissed. It very well may be presumed that the elective speculation (Ha) is acknowledged, showing a concurrent impact between the OSH knowledge (X1) and work experience (X2) variables on unsafe actions (Y) at PT. WIKA BKU-KSO.

3.3.3 t Test

The t test is used to determine the individual impact of independent variables on the dependent variable, specifically examining how OSH knowledge (X1) and work experience (X2) affect unsafe actions (Y). The results of the t test are presented in Table 10.

Table 10. The Result of t Test

Variable	$t_{calculate}$	t_{table}	sig	Description
OSH Knowledge	5,197	1,717	< 0.001	Influential
Work Experience	4,295	1,717	< 0.001	Influential

Source: Primary data processed in 2024

In view of the estimations above, it is known that the $t_{calculate} > t_{table}$ (5,197 > 1,717) and the significance value is < 0.001 < 0.05. Therefore, the invalid speculation (Ho) is dismissed. It very well may be presumed that the OSH knowledge partially has a significant value on unsafe actions in employees at PT. WIKA BKU-KSO. In view of the second computations above, it is seen that the worth $t_{calculate} > t_{table}$ (4,295 > 1,717) and the significance value is < 0,001 < 0,05. Therefore the invalid speculation (Ho) is dismissed. It tends to be inferred that the work experience significantly influences unsafe actions at PT. WIKA BKU-KSO.

3.3.4 Coefficient Determination (R^2)

The purpose of the R squared test is to reveal the correlation between OSH knowledge and work experience on unsafe actions. R squared is a number demonstrating the extent of the reliant variable's variety made sense of by the free factors. Table 11. shows the result of the R square test:

Table 11. The Result of Coefficient Determination R^2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.904	0.818	0.801	0.955

Source: Primary data processed in 2024

The outcomes from the table 11. above demonstrate a R Square worth of 0.801 or 80,1%. This implies that the extent of variety in the unsafe actions made sense of by the OSH knowledge and work experience is 80,1%, while 19,9% of the variety in different factors isn't made sense of in this review. For instance, factors, for example, work exhaustion, workplace, and others (Kedang et al., 2023; Yudhawan & Dwiyanti, 2017).

4. CLOSING

In light of the consequences of the examination, this research reveals that OSH knowledge and work experience together can influence unsafe actions among workers. Work experience by 44,5% has a greater influence compared to OSH knowledge by 44,3%, it enables workers to gain experience in preventing unsafe actions and avoiding workplace accidents on projects. The OSH knowledge by variable individually has a significant impact on unsafe actions among workers with significance values is < 0.001. The work experience individually has a significant impact on unsafe actions among workers with significance values is < 0.001.

For future researchers, it is recommended to increase the number of respondents to get details data. It is hoped that they pay more attention to the number of questions in the questionnaire to ensure that their research is more comprehensive and beneficial than this study. It would be beneficial for the SMK3 management to continuously improve the occupational safety and health training programs so that workers have high OSH knowledge, enabling them to prevent workplace accidents.

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