Analysis of the Effect of Occupational Safety and Health and Work Environment on Employee Performance with Job Satisfaction as an Intervening Variable at PT XYZ

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Abstract. This study aims to determine the effect of occupational safety and health and the work environment on employee performance directly and indirectly. The objects in this study include production unit employees at XYZ company. This type of research approach is a descriptive quantitative approach. The data in this study were taken from a sample of 100 respondents selected using a simple random sample technique. Data analysis was carried out with a structural equation model (SEM) with Partial Least Square (PLS) analysis through the SmartPLS 4.0 application. This analysis provides results that occupational safety and health has a positive and significant impact on employee performance, including indirectly through job satisfaction. In contrast, the work environment does not have a direct impact on employee performance, but indirectly affects employee performance through job satisfaction.

Keywords: Occupational Safety and Health, Work Environment, Job Satisfaction, Employee Performance.

1 Introduction

The rapid development of the industrial world requires companies to maximize all their resources, so that a qualified workforce needs to be owned by the company. That is because one of the main factors for companies in achieving targets and goals is through labor [1]. Occupational safety and health with relation to employee performance can determine the success of a company in achieving the set targets due to the optimal impact of work situations that affect it. Companies also need to pay important attention to occupational health in an effort to improve employee performance. good performance cannot be separated from good employee health as well. Employees have the right to get guarantees for the safety and health of the work performed [2].

The condition of individuals in a company is inseparable from the influence of the work environment which provides important value directly or indirectly for employees [3]. For employees if they work well, it will cause a sense of satisfaction at work. The positive feelings that arise from the assessment of employees of their work cause a sense of satisfaction in

employees. Every employee certainly wants his workplace to provide satisfaction. This feeling of satisfaction is expected to increase employee effort and work enthusiasm [4].

Efforts to improve employee performance are also made by PT XYZ as one of the manufacturing companies in Batam city. It was found that the company has implemented occupational safety and health programs by applying standards in the form of SMK3 (Occupational Safety and Health Management System) as an important program based on Government Regulation No. 50 of 2012, the company's own policy standards namely MESH (Management of Environment, Safety and Health), and ISO 14001 as an environmental management guideline. The level of achievement of occupational safety and health performance at PT XYZ can be seen in the table below:

Tabel 1. Indicators of Work Accident Cases at PT XYZ

Indicator	2022 Actual	2023 Target	2023 Actual
Total Recordable Case Rate (TRCR)	0.00	0.00	0.00
Days Away Case Rate (DACR)	0.00	0.00	0.00
Total Recordable Cases	0	0	0
Total Days Away Cases	0	0	0
Total Severe Cases	0	0	0
Total First Aid Cases	0	0	0
Total Near-Miss Cases	1	0	1
Near Miss Ratio	0	0	0
Regulatory Notification	0	0	0

The ratio of occupational accidents in 2022 to 2023 always reached the target of zero accident cases. However, in the same period there was one near miss case in the company. However, PT XYZ has a good occupational safety and health culture by conducting risk analysis on all work processes and equipment. As well as providing PPE (Personal Protective Equipment) to employees that have been adjusted to the risk analysis in each work area. In general, employee performance at PT XYZ can be said to have not received maximum results. There are several previous studies with similar topics, In research from Patradhiani, et al [5], Setyawati & Soedarmadi [6], Wicaksono, et al [7] it was found that directly occupational safety and health, and the work environment have an influence on employee performance. In addition, there is an indirect effect of occupational safety and health through job satisfaction on employee performance. According to the background that has been described, this study wants to re-explore the relationship between related variables, namely occupational safety and health, work environment, employee performance, and job satisfaction. The method used for analysis in this study with PLS-SEM (Partial Least Square-Structural Equation Model).

2 Literature Review

2.1 Occupational Safety and Health

Occupational safety and health as an action in creating safe working conditions, preventing themselves from physical and mental problems with training, guidance, and control of fellow workers and providing assistance according to company regulations. [8] Occupational safety

and health is a thought and effort to ensure the work of employees both physically and mentally in general and culture towards a prosperous and equitable condition [9]

2.2 Work Environment

According to Darvis in [3], the work environment in a company has an important value for individuals who work in it, because the environment plays a role both directly and indirectly on the condition of the individuals in it. So that the work environment in a company really needs to be considered by management.

2.3 Job satisfaction

Job satisfaction is defined as employee's positive feeling toward their job [9] Job satisfaction also has an important role in employee self-actualization. employees who do not get job satisfaction will not experience psychological maturity. In contrast, employees who get good job satisfaction will have a good record of attendance, turnover and work performance [10].

2.4 Employee Performance

Performance is everything related to the work of a task and the results of the work of the task itself [11]. Performance has a measurement and evaluation system, and performance appraisal is one of the management tools in shaping the motivation and competitiveness of workers to get maximum value in order to gain recognition for their achievements. This recognition can be in the form of salary increases, promotions, facilities, and awards. [12].

3. Hypothesis

This framework provides an overview of how the influence between the independent variable and the dependent variable based on previous research. This framework provides an overview related to the hypothesis applied in this study in forming the same perception or opinion between researcher and readers on the lines of thought in this study. The following is a framework for thinking in this study:
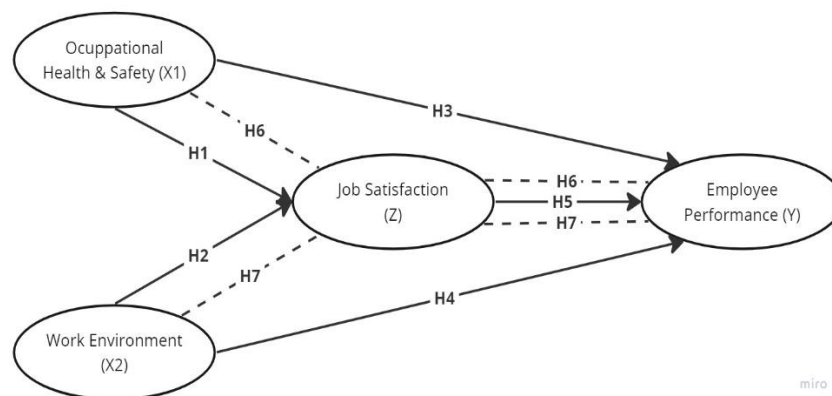

Fig. 1. Hypothesis Framework.

4. Research Methods

This study adopts quantitive method as its main approach. The data in this study are quantitative data in the form of primary data from respondents' answers using instruments in the form of questionnaires or questionnaires. In measuring respondents' answers using a Likert scale with 5 categories. In this study, the population was determined in the form of production employees at PT XYZ totaling 131 people. Determination of the number of samples used the Slovin formula which resulted in 100 respondents. The sample is determined based on probability sampling technique which means that it provides equal opportunities for members of a population. [13]. With simple random sampling as the sampling technique. The data were analyzed through the PLS (Partial Least Square) method which is a SEM (Structural Equation Model) equation model based on variance or component-based structural equation modeling. The SmartPLS 4.0 program was used for data analysis by utilizing bootstrapping or random doubling.

5. Results and Discussion

5.1 Outer Model Evaluation

Outer model evaluation is carried out to show the relationship between indicator blocks and latent variables. The approach used in confirmatory analysis is the MTMM (MultiTrait-MultiMethod) approach which aims to test convergent and discriminant validity. While testing reliability, there are two methods used, including cronbach's alpha and composite reliability [14]

Convergent Validity

The validity of an indicator is said to be good if the value is above 0.70. Meanwhile, a loading factor that is between 0.50 to 0.60 is sufficient or considered adequate [14].

Table 2. Outer Loading Value

Variables	Indicator	Outer Loadings	Description
	OHS1	0.909	Valid
	OHS2	0.873	Valid
Occupational Safety and Health	OHS3	0.867	Valid
	OHS4	0.801	Valid
	OHS5	0.894	Valid
	OHS6	0.882	Valid
	WE1	0.820	Valid
	WE2	0.816	Valid
Work Environment	WE3	0.845	Valid
	WE4	0.883	Valid
	WE5	0.718	Valid
	EP1	0.868	Valid
	EP2	0.909	Valid
Employee Performance	EP3	0.829	Valid
	EP4	0.935	Valid
	EP5	0.703	Valid
Job Satisfaction	JS1	0.843	Valid
	JS2	0.893	Valid

Variables	Indicator	Outer Loadings	Description
	JS3	0.902	Valid
	JS4	0.904	Valid
	JS5	0.84	Valid
	JS6	0.74	Valid

The outer loading value shown in the table and figure above, the convergent validity results of the latent variables that produce outer loading are above 0.70. Thus, it can be said that these indicators have met the validity requirements. Apart from looking at the loading factor, the AVE value is also used to test convergent validity.

Table 3. AVE Value

Variables	AVE Value
Occupational Safety and Health	0.760
Work Environment	0.669
Employee Performance	0.727
Job Satisfaction	0.732

Referring to the AVE value in the table above, each variable shows high validity because the AVE value is above 0.5. This means that each latent variable meets the convergent validity criteria and successfully represents the indicators in its block.

Discriminant Validity

In the discriminant validity test, it can be seen from the cross loading between the indicator and its construct. Indicators with valid conditions are described if the loading factor value on the construct that is the goal is higher than on other constructs [14].

Table 4. Cross Loading Value

	OHS	WE	EP	JS
OHS1	**0.909**	0.652	0.740	0.707
OHS2	**0.873**	0.593	0.699	0.635
OHS3	**0.867**	0.687	0.714	0.671
OHS4	**0.801**	0.514	0.630	0.622
OHS5	**0.894**	0.665	0.720	0.662
OHS6	**0.882**	0.615	0.717	0.678
WE1	0.582	**0.820**	0.528	0.506
WE2	0.517	**0.816**	0.481	0.511
WE3	0.608	**0.845**	0.606	0.629
WE4	0.708	**0.883**	0.708	0.729
WE5	0.473	**0.718**	0.525	0.673
EP1	0.671	0.584	**0.868**	0.767
EP2	0.777	0.621	**0.909**	0.839
EP1	0.606	0.553	**0.829**	0.675
EP1	0.804	0.672	**0.935**	0.835
EP1	0.549	0.582	**0.703**	0.673
JS1	0.554	0.595	0.711	**0.843**
JS2	0.577	0.631	0.764	**0.893**
JS3	0.608	0.644	0.756	**0.902**
JS4	0.789	0.690	0.882	**0.904**

	OHS	WE	EP	JS
JS5	0.801	0.658	0.841	**0.840**
JS6	0.514	0.676	0.583	**0.740**

Referring to the cross loading value in the table above, each indicator provides a large cross loading value on the intended latent variable compared to other latent variables. Thus, the validity of each indicator is said to be good in measuring each intended variable.

Table 5. AVE Root Value

	OHS	WE	EP	JS
OHS	**0.872**			
WE	0.714	**0.818**		
EP	0.808	0.708	**0.894**	
JS	0.761	0.758	0.853	**0.856**

Referring to the AVE root value, it shows that the AVE root value of all construct variables is higher than its correlation with other variables. Thus, all variables in this study have a high level of discriminant validity.

Reliability

The level of accuracy, consistency and reliability of the instrument in measuring each construct with reflective indicator types is done in two ways, namely with Cronbach's Alpha and Composite Reliability. A construct is declared reliable if the value of Composite reliability and Cronbach's alpha exceeds 0.70 [14].

Table 6. Cronbach's Alpha & Composite Reliablity Value

	Cronbach's alpha	Composite reliability
Occupational Safety & Health	0.936	0.938
Work Environment	0.876	0.887
Employee Performance	0.904	0.916
Job Satisfaction	0.926	0.934

The Conbach's alpha value and composite reliability value of each variable in this study show high reliability, with each variable having a value exceeding 0.70. Therefore, it means that each question used is considered reliable.

5.2 Inner Model Evaluation

R-Square
In this test, the criteria for model strength can be used. The R-square value of 0.75 is strong, 0.50 is moderate, and 0.25 is weak [14].

Table 7. R-square value

Variables	R-square
Employee Performance.	0.838
Job Satisfaction	0.673

The R-Square value for employee performance is 0.838, where 83.8% of employee performance is impacted by occupational safety health, work environment, and job satisfaction. The rest 16.2% is impacted by other factors. Meanwhile, the R-Square value for job satisfaction is 0.673 or 67.3% of job satisfaction is impacted by occupational safety and health and work environment. The rest 32.7% is impacted by other factors.

5.3 Hypothesis Test

The estimated assessment in the path relationship in the structural model must get a significant value. Assuming that the t-statistic > dari t-tabel 1.96 and or p-values < 0.05 means that the hypothesis can be accepted.

Table 8. Path Coefficient

	Original Sample	T Statistics	P Values
OHS -> Job Satisfaction	0.448	3.737	0.000
Work Environment -> Job Satisfaction	0.438	3.452	0.001
OHS -> Employee Performance	0.314	2.774	0.006
Work Environment -> Employee Performance,	-0.030	0.353	0.724
Job Satisfaction -> Employee Performance	0.678	6.759	0.000

H1 : Occupational Safety and Health Job Satisfaction
The path coefficient results show that occupational safety and health has a significant positive effect on employee satisfaction at work. Evidenced by the t-statistic value of 3.737> 1.96, original sample 0.448, and p-value 0.000 <0.05. So, it is concluded that **Hypothesis 1 can be accepted**.

H2 : Work Environment to Job Satisfaction
Path coefficient results that the work environment has a significant positive effect on employee satisfaction at work. Evidenced by the t-statistic value of 3.452> 1.96, original sample 0.438, and p-value 0.001 <0.05. Thus, it is concluded that **Hypothesis 2 can be accepted.**

H3 : Occupational Safety and Health on Employee Performance
Path coefficient results in that occupational safety and health has a significant positive effect on employee performance. Evidenced by the t-statistic value of 2.774> 1.96, original sample, 0.314 and p-value 0.006 <0.05. thus, it is concluded that **Hypothesis 3 can be accepted.**

H4 : Work Environment on Employee Performance
Path coefficient results that employee performance is not directly influenced either positively or significantly from the work environment with a t-statistic value of 0.353 < 1.96, original sample value -0.030 and p-value 0.724 > 0.05. Thus, it is concluded that **Hypothesis 4 cannot be accepted.**

H5 : Job Satisfaction on Employee Performance

Path coefficient shows the role of job satisfaction in influencing employee performance positively and significantly. Evidenced by the t-statistic value of 6.759> 1.96, original sample 0.678, and p-value 0.000 <0.05. Thus, it is concluded that **Hypothesis 5 is accepted.**

Table 9. Specific Indirect Effect

	Original Sample	T Statistics	P Values
OHS -> Job Satisfaction -> Employee Performance	0.303	3.307	0.001
Work Environment -> Job Satisfaction -> Employee Performance	0.297	3.125	0.002

H6 : Job Satisfaction mediates Occupational Safety and Health on Employee Performance

The value of the specific indirect effect above results in that there is a role of satisfaction that mediates occupational safety and health factors in influencing employee performance. Indicated by the t-statistic value of 3.307> 1.96, original sample 0.303, and p-value 0.001 <0.05. Thus, it is concluded that **Hypothesis 6 can be accepted**.

H7 : Job Satisfaction mediates Work Environment on Employee Performance

The value of the specific indirect effect results in that there is a role of job satisfaction that mediates work environment factors in influencing employee performance. It is shown through the t-statistic of 3.125> 1.96, original sample of 0.297 and p-value 0.002 <0.05. Thus, it is concluded that **Hypothesis 7 can be accepted**.

6. Conclusion and Recommendation

6.1 Conclusion

The conclusions that can be drawn from the results of the data analysis above can be explained as follows:

1. Occupational safety and health has a positive and significant influence on job satisfaction. This shows that the better the implementation of occupational safety and health at PT XYZ, the more job satisfaction increases.
2. The work environment has a positive and significant influence on job satisfaction. This shows that the better the work environment situation at PT XYZ, the higher the level of employee job satisfaction.
3. Occupational safety and health has a positive and significant influence on employee performance. The existence of a positive relationship between the implementation of safety and health and the level of employee performance shows how important these arrangements are at PT XYZ.
4. The work environment has no direct effect on employee performance. This indicates that employee performance is not directly influenced by the current condition of the work environment at PT XYZ.
5. Job satisfaction has a positive and significant influence on employee performance. This means that if the level of employee job satisfaction is good, the higher the level of employee performance.

6. Job satisfaction as an intermediary that affects the relationship between occupational safety and health and employee performance. This means that by creating a sense of employee satisfaction with the implementation of safety and health at PT XYZ will have an impact on improving employee performance.
7. Job satisfaction also acts as an intervening variable in connecting the work environment with its effect on employee performance. This means that the creation of employee satisfaction with the work environment at PT XYZ will have an indirect impact on employee performance.

6.2 Recommendation

Based on the previous conclusions, there are several suggestions that are expected to provide benefits for PT XYZ, namely as follows:
1. Companies are expected to improve the implementation of occupational safety and health programs that are already running well at this time. Given the importance of the occupational safety and health system in preventing the risk of work accidents and occupational diseases. It is also expected to maintain performance in implementing the occupational safety and health management system by complying with all the requirements listed in it and carrying out internal and external audits properly.
2. Companies are expected to improve work environment conditions, especially in the production section. This is because the work environment is where work is done and everything that is around employees in carrying out their work. So that supporting facilities such as adequate lighting, comfortable air temperature and cleanliness of the work area need to be maintained and improved.
3. The company is expected to increase employee satisfaction at work by fulfilling employee rights, especially in getting guarantees to work safely and securely by always being pro-active in analyzing all potential risks in the work area and maintaining a safe and conducive work environment. In addition, management and superiors must also be able to always provide support to employees and give appreciation to employees who have good performance so that this can be a motivation for employees to always improve their performance.

References

[1] C. Chotimah, "Pengaruh Kompetensi dan K3 (Keselamatan dan Kesehatan Kerja) terhadap Kinerja Karyawan pada PT. Lotus Indah Textile Industries Bagian Winding di Nganjuk," Jurnal Ilmu Manajemen, vol. 6, no. 3, p. 118, 2018.

[2] F. P. Wibowo dan G. Widiyanto, "Pengaruh Keselamatan dan Kesehatan Kerja dan Lingkungan Kerja terhadap Kinerja Karyawan Bagian Produksi pada Perusahaan Tom's Silver Yogyakarta," Jurnal Ekonomi dan Bisnis, vol. 17, no. 2, pp. 142-156, 2019.

[3] R. D. Parashakti dan Putriawati, "Pengaruh Keselamatan dan Kesehatan Kerja (K3), Lingkungan Kerja dan Beban Kerja terhadap Kinerja Karyawan," Jurnal Ilmu Manajemen Terapan, vol. 1, no. 1, pp. 290-304, 2020.

[4] Rosmaini dan H. Tanjung, "Pengaruh Kompetensi, Motivasi dan Kepuasan Kerja Terhadap Kinerja Pegawai," Jurnal Ilmiah Magister Manajemen, vol. 2, no. 1, pp. 1-15, 2019.

[5] R. Patradhiani, M. Amelia dan M. Rosyidah, "Pengaruh Keselamatan Kesehatan Kerja Terhadap Produktivitas Karyawan Dengan Metode Partial Least Square," Jurnal Hasil Penelitian dan Karya Ilmiah Dalam Bidang Teknik Industri, vol. 8, no. 2, pp. 305-313, 2022.

[6] A. N. Setyawati dan Soedarmadi, "Analisis Pengaruh Keselamatan Kerja dan Kesehatan Kerja Terhadap Kinerja Karyawan dengan Kepuasan Kerja Sebagai Variabel Intervening Pada Karyawan," Solusi : Jurnal Ilmiah Bidang Ilmu Ekonomi, vol. 19, no. 2, pp. 112-127, 2021.

[7] R. M. Wicaksono dan Dkk., "Pengaruh Pelatihan, Lingkungan Kerja, dan Disiplin terhadap Kinerja Anggota dan Kepuasan Kerja sebagai Variabel Intervening (Studi Kasus Div X)," Jurnal Ilmu Multidisiplin, vol. 1, no. 4, pp. 862-873, 2023.

[8] M. D. Bhastary dan K. Suwardi, "Analisis Pengaruh Keselamatan dan Kesehatan Kerja (K3) dan Lingkungan Kerja Terhadap Karyawan di PT Samudera Perdana," Jurnal Manajemen dan Keuangan, vol. 7, no. 1, pp. 47-60, 2018.

[9] J. R. Arrozak, A. A. Suhendra dan I. Mufidah, "The Effect of Work Environment, OHS, and Job Satisfaction on Employee Performance: A Case Study of Private Defense Company in Indonesia," International Journal of Innovation in Enterprise System, vol. 5, no. 1, pp. 78-89, 2021.

[10] I. Syahputra, "Pengaruh Diklat, Promosi, dan Kepuasan Kerja terhadap Kinerja Pegawai," Jurnal Ilmiah Magister Manajemen, vol. 2, no. 1, pp. 104-116, 2019.

[11] D. Qurbani dan U. Selviyana, "Pengaruh Keselamatan dan Kesehatan Kerja (K3) terhadap Kinerja Karyawan Pada PT. Trakindo Utama Cabang BSD," Jurnal Ilmiah Manajemen FORKAMMA, vol. 1, no. 3, pp. 110-129, 2018.

[12] N. N. A. Aprianti dan F. Almansur, "Effect of Occupational Health and Safety on Employee Performance in Fishing Company," Jurnal Manajemen, vol. 12, no. 1, pp. 1-9, 2022.

[13] Sugiyono, Metode Penelitian Kuantitatif Kualitatif dan R&D, Bandung: ALFABETA, 2018.

[14] I. Ghozali dan H. Latan, Partial Least Squares: Konsep, Teknik, dan Aplikasi Menggunakan Program Smart PLS 3.0., Semarang: Badan Penerbit Undip, 2014.