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The Role of Occupational Health and Safety in Mediating the Effects of Job Demands and Job Risks on Employee Performance at PT Pertamina Patra Niaga Surabaya Branch

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ABSTRACT

This study employs a quantitative approach utilizing an explanatory causal research design. The population for this study comprises 206 employees at PT Pertamina Patra Niaga Surabaya Branch. The sampling technique utilized was total sampling (saturated sampling), resulting in a final sample size of 206 employees who met the established criteria. Data collection was conducted using google form, with measurement carried out via a likert scale. Subsequently, data processing was performed using the Structural Equation Modeling (SEM) method with the assistance of partial least square (PLS) 4.0 software. The results of this study indicate several key findings: 1) Job demands have a positive and significant effect on occupational health and safety (OHS); 2) Job risk has a positive and significant effect on occupational health and safety; 3) Occupational health and safety has a positive and significant effect on employee performance; 4) Occupational health and safety effectively mediates the relationship between job demands and employee performance; and 5) Occupational health and safety effectively mediates the relationship between job risk and employee performance. Based on these findings, the study recommends that management should proactively assess risks, develop emergency response procedures, and update safety protocols. Additionally, the company must foster a culture of risk reporting that is free from stigma. Furthermore, it is crucial to maintain and increase investment in OHS programs. This should not be done merely for compliance, but as an integral part of the business strategy designed to enhance employee performance, satisfaction, and loyalty.

ABSTRAK

Studi ini menggunakan pendekatan kuantitatif dengan memanfaatkan desain penelitian kausal eksploratif. Populasi penelitian ini terdiri dari 206 karyawan di PT Pertamina Patra Niaga Cabang Surabaya. Teknik pengambilan sampel yang digunakan adalah total sampling (sampling jenuh), menghasilkan ukuran sampel akhir sebanyak 206 karyawan yang memenuhi kriteria yang ditetapkan. Pengumpulan data dilakukan menggunakan google form, dengan pengukuran dilakukan melalui skala Likert. Selanjutnya, pengolahan data dilakukan menggunakan metode structural equation modeling (SEM) dengan bantuan perangkat lunak partial least square (PLS) 4.0. Hasil penelitian ini menunjukkan beberapa temuan utama: 1) Tuntutan pekerjaan memiliki pengaruh positif dan signifikan terhadap kesehatan dan keselamatan kerja (K3); 2) Risiko pekerjaan memiliki pengaruh positif dan signifikan terhadap kesehatan dan keselamatan kerja; 3) Kesehatan dan keselamatan kerja memiliki pengaruh positif dan signifikan terhadap kinerja karyawan; 4) Kesehatan dan keselamatan kerja secara efektif memediasi hubungan antara tuntutan pekerjaan dan kinerja karyawan; dan 5) Kesehatan dan keselamatan kerja secara efektif memediasi hubungan antara risiko pekerjaan dan kinerja karyawan. Berdasarkan temuan ini, studi ini merekomendasikan agar manajemen secara proaktif menilai risiko, mengembangkan prosedur tanggap darurat, dan memperbarui protokol keselamatan. Selain itu, perusahaan harus menumbuhkan budaya pelaporan risiko yang bebas dari stigma. Lebih lanjut, sangat penting untuk mempertahankan dan meningkatkan investasi dalam program K3. Hal ini tidak boleh dilakukan hanya untuk kepatuhan, tetapi sebagai bagian integral dari strategi bisnis yang dirancang untuk meningkatkan kinerja, kepuasan, dan loyalitas karyawan.

INTRODUCTION

In the era of global business competition, organizations are required to optimize Human Resources (HR) due to their central role in corporate success and sustainability. Employee performance serves as a crucial aspect reflecting the quality and quantity of work results, which is influenced by various internal factors such as leadership and the work environment (Putri & Rahman, 2021). Optimal performance emerges when an organization is capable of creating a

conducive environment that supports employees' psychological needs, thereby motivating them to make maximum contributions (Sutrisno & Lestari, 2024). A profound understanding of performance is essential as a basis for managerial decision-making to maintain organizational competitiveness (Vermeeren et al., 2024).

Specific performance and operational issues are identified in the Fuel Tanker (MT) fleet data at IT Surabaya for the period of August–September 2025. The data reveals a significant gap between the maximum available capacity and the actual transport realization, where there is a lost capacity of 952 KL, or approximately 15.6% of the total capacity. This is caused by the non-operation of 35 fleet units, dominated by large-capacity units (24 KL and 32 KL). Notably, these two types of units constitute the backbone of fuel distribution in the Surabaya region, which should ideally support 78% of the total transport capacity.

The operational sub-optimality of these large-capacity fleets creates serious chain effects. Beyond the risk of Delivery Order (DO) completion delays and potential fines, this situation increases work pressure on the remaining tank crews. The limitation of units forces drivers to pursue tight distribution targets, which in turn increases the risk of fatigue and workplace accidents. This phenomenon creates a dilemma between the need to meet distribution productivity targets and the obligation to maintain Occupational Health and Safety (OHS/K3) standards.

In high-risk sectors, the definition of employee performance has shifted toward a balance between job demands and safety compliance. Studies indicate that excessive job demands without supporting resources have a negative correlation with safety behavior (Seo & Yoon, 2025). Conversely, the implementation of an effective Occupational Health and Safety Management System (OHSMS) can function as a catalyst that mediates the improvement of employee performance (Claro et al., 2025). Furthermore, to address performance decline due to burnout, new managerial approaches are required, such as a coaching leadership style, which is proven to be more effective in increasing productivity compared to an authoritarian style.

The theoretical foundation of this research utilizes the Resource-Based View (RBV), which views employees as strategic assets that are valuable, rare, inimitable, and non-substitutable (Barney, 1991). However, these assets face high job demands that, if excessive, can trigger burnout (Schaufeli & Bakker, 2024), as well as job risks that threaten physical and mental safety (Clarke, 2020). Therefore, Occupational Health and Safety (OHS) is necessary as a protection mechanism to ensure employees can work productively without sacrificing safety (Goetsch, 2020).

Previous research reinforces the urgency of integrating HRM and OHS. It has been found that psychosocial risks are significant predictors of burnout (Adamopoulos et al., 2023), while the integration of HRM practices and OHS is proven to support sustainable organizational outcomes in the manufacturing sector (Ateeq et al., 2024). HRM practices that enhance resilience also influence employees' perceptions of workload (Phil Kim et al., 2024). Based on this, the conceptual framework of the research positions OHS as a mediating variable that connects job demands and job risks with employee performance.

This research focuses on PT. Pertamina Patra Niaga Surabaya Branch given its strategic role in national energy distribution, which carries high risks. The high work pressure and operational risks in the field have the potential to degrade employee performance if not managed correctly. Therefore, this research is important to prove that the implementation of OHS is not merely a regulatory obligation, but a vital strategy to mitigate the negative impacts

of work pressure, prevent human error, and ensure the smooth and safe distribution of energy sustainably.

RESEARCH METHOD

This research employed a quantitative approach with an explanatory causal design to analyze the cause-and-effect relationships between job demands and job risks variables toward employee performance, with Occupational Health and Safety (OHS) acting as a mediating variable. The study was conducted at PT. Pertamina Patra Niaga Surabaya Branch in September 2025, focusing on the Tank Truck Crew (Awak Mobil Tangki or AMT) division. The research population encompassed all AMT employees in the productive age category (26–40 years) assigned to distribute 24 KL capacity fuel. Considering the importance of total representation in a high-risk work environment, the sampling technique utilized was saturated sampling (census), thereby involving the entire population of 206 respondents as research subjects.

The operational framework of this research measured four main variables using a 5-point Likert Scale. The independent variables consisted of Job Demands (encompassing quantitative, emotional, cognitive, and physical workloads) and Job Risks (including concerns over job loss and future uncertainty). These variables were hypothesized to influence Employee Performance (measured through quantity, quality, timeliness, effectiveness, and attendance) via OHS mediation. OHS itself was measured through indicators of management commitment, training procedures, a safe physical environment, and safety climate, functioning as a systematic protection mechanism for the workforce.

For model testing, primary data was collected through the distribution of Google Form-based questionnaires to all respondents, supported by secondary data from literature studies. Data analysis was performed using the Structural Equation Modeling (SEM) method with the assistance of SmartPLS 4.0 and SPSS version 26 software. The analysis stages included descriptive statistics, validity and reliability tests, outer model evaluation (measurement model), and inner model analysis (structural model). This Partial Least Squares (PLS) approach was selected due to its capability to test complex relationships between latent variables and simultaneously predict direct and indirect effects within the mediation mechanism.

To ensure the validity of the Partial Least Squares (PLS) analysis, the instrument development was grounded in established theoretical frameworks. The questionnaire consisted of 17 items measuring four latent constructs. Each item was assessed using a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

RESULTS

Evaluation of the Measurement Model (Outer Model)

According to Ghozali (2015:39), the objective of the outer model evaluation is to assess validity through convergent validity and discriminant validity, as well as model reliability evaluated using composite reliability and Cronbach's alpha for its indicator blocks.

Convergent Validity

Convergent validity is used as a crucial test of the measurement model to assess the level of correlation between indicators within a construct. The criterion used is the value of the indicator's loading factor on the construct. Chin (2015) establishes a loading of > 0.70 as an indication of strong validity, implying that the indicator consistently represents the latent construct. Nevertheless, values between 0.50 and 0.60 are still acceptable in exploratory research

or studies with a limited number of indicators. If there are indicators with loading factors below 0.50, these indicators do not adequately represent the construct and must be removed from the model to improve quality and validity.

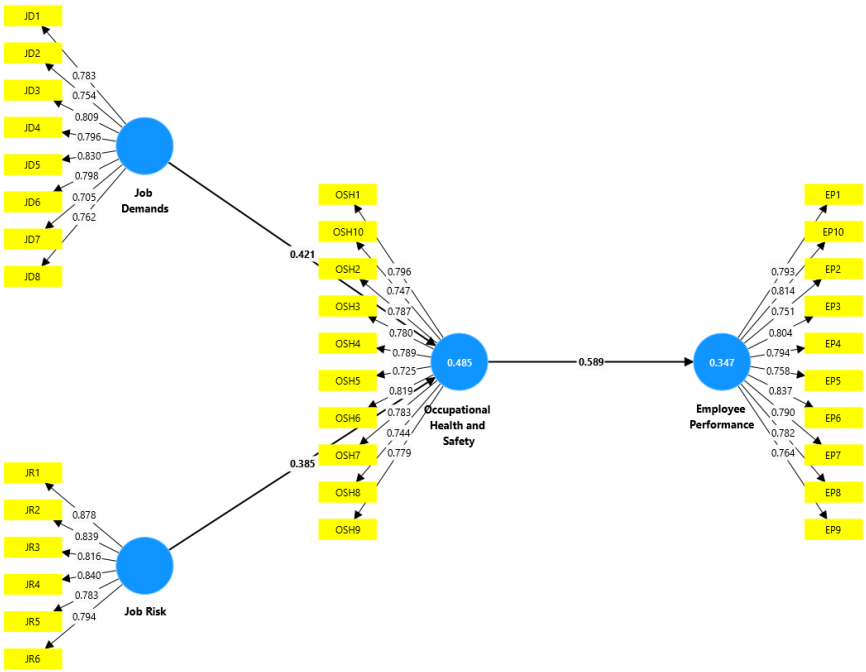

Figure 1. SmartPLS 4.0 Algorithm Results

Source: SmartPLS 4.0 Processing Output

In Figure 1, the data processing results above show that all indicators have achieved the expected value of > 0.70. The data indicates that the factor values are in accordance with expectations and can be observed in the following table.

Discriminant Validity

The subsequent examination involves comparing the correlations between variables with the square root of the Average Variance Extracted (AVE). The measurement model demonstrates good discriminant validity if the AVE for each variable is greater than the correlations between that variable and other variables. The values can be observed from the Fornell-Larcker Criterion Output in Smart-PLS 4.0, as presented in the table below.

Table 1. Discriminant Validity Test Results (Fornell-Larcker Criterion)

	Employee Performance	Job Demands	Job Risk	Occupational Health and Safety
Employee Performance	0.789			
Job Demands	0.389	0.780		
Job Risk	0.410	0.492	0.826	
Occupational Health and Safety	0.589	0.611	0.592	0.775

Source: SmartPLS 4.0 Processing Output, 2025

From Table 1 above, it can be concluded that the square root of the Average Variance Extracted (AVE) for each construct (diagonal values) is greater than the correlation between that construct and other constructs in the model.

Average Variance Extracted (AVE)

The AVE value is intended to measure the level of variance of a construct component captured from its indicators by adjusting for the error level. Testing with the AVE value is considered more stringent than composite reliability. The recommended minimum AVE value is 0.50. The AVE output obtained from SmartPLS 4.0 is presented in Table 2.

Table 2. Average Variance Extracted (AVE) Test Results

	Average variance extracted (AVE)
Employee Performance	0.623
Job Demands	0.609
Job Risk	0.682
Occupational Health and Safety	0.601

Source: SmartPLS 4.0 Processing Output, 2025

Based on Table 2 above, it can be seen that the AVE values are greater than 0.50, which means that all indicators have met the established criteria and possess the potential reliability required for further testing.

Composite Reliability and Cronbach's Alpha

Table 3. Composite Reliability and Cronbach's Alpha Test Results

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
Employee Performance	0.933	0.935	0.943
Job Demands	0.909	0.914	0.926
Job Risk	0.906	0.910	0.928
Occupational Health and Safety	0.926	0.929	0.938

Source: SmartPLS 4.0 Processing Output, 2025

Table 3 demonstrates satisfactory Composite Reliability and Cronbach's Alpha test results. All latent variables are reliable, with Composite Reliability and Cronbach's Alpha values ≥ 0.70. This indicates that the research instrument possesses high internal consistency, rendering the questionnaire dependable, reliable, and suitable for subsequent analysis.

Structural Model Evaluation (Inner Model)

After the Outer Model meets the evaluation criteria, the analysis proceeds to the Inner Model or structural model testing. In SEM, this stage aims to verify the relationships between latent constructs in accordance with the theory and conceptual framework. The primary focus is to prove the significance of the influence of independent variables on the dependent variable, aligning with the hypotheses. Comprehensive evaluation encompasses the analysis of the direction and strength of relationships (path coefficients) via bootstrapping, as well as the assessment of the model's predictive quality using R-square and Q-square.

R-Square (R^2)

Inner model testing is conducted to examine the relationship between significant value constructs and the R-square of the research model. Assessing the model using PLS begins by observing the R-square for each dependent variable.

Table 4. R-Square (R^2) Test Results

	R-square	R-square adjusted
Employee Performance	0.347	0.344
Occupational Health and Safety	0.485	0.480

Source: SmartPLS 4.0 Processing Output, 2025

1. The R-Square value for the Employee Performance variable is 0.347. This result indicates that the ability of the independent variables to explain the variation or diversity in the Employee Performance variable is 34.7 percent, while the remaining 65.3 percent is explained by variables or other factors outside the proposed research model.
2. The R-Square value for the Occupational Health and Safety variable is 0.485. This figure indicates that the influencing variables (Job Demands and Job Risk) are able to contribute an influence on the variability of Occupational Health and Safety by 48.5 percent, while the remaining 51.5 percent is influenced by other factors not included in this research model.

Q-Square (Goodness of Fit Model)

The Structural Goodness of Fit Model testing on the inner model utilizes the predictive relevance (Q^2) value. A Q-Square value greater than 0 (zero) indicates that the model possesses predictive relevance. The R-Square values for each endogenous variable in this study can be seen in the following calculation:

Table 5. Q-Square Test Results

	SSO	SSE	Q^2 (=1-SSE/SSO)
Employee Performance	2060.000	1628.159	0.210
Occupational Health and Safety	2060.000	1479.237	0.282

Source: SmartPLS 4.0 Processing Output, 2025

1. The Q-Square value for the Employee Performance variable is 0.210. Based on the Goodness of Fit testing criteria where the Q-Square value must be greater than 0 (zero), this result indicates that the model has predictive relevance. This means the constructed observation model is well-structured and possesses the ability to predict phenomena regarding the Employee Performance variable.
2. The Q-Square value for the Occupational Health and Safety variable recorded a figure of 0.282. Since this value is positive or greater than 0 (zero), it can be concluded that this model also meets the predictive relevance criteria. This result shows that the exogenous variables in the model have strong relevance in predicting the Occupational Health and Safety variable.

Hypothesis Testing Results (Path Coefficient Estimation)

To ensure the significance of the path influence in the structural model, estimation is performed using the bootstrapping procedure. The determination of hypothesis significance is

based on the analysis of parameter coefficients and t-statistic values generated from the bootstrapping report. Using a t-table of 1.96 at a significance level of 0.05 (5%), the t-statistic (t-count) value is then compared. If the t-count is greater than the t-table, the influence is considered significant.

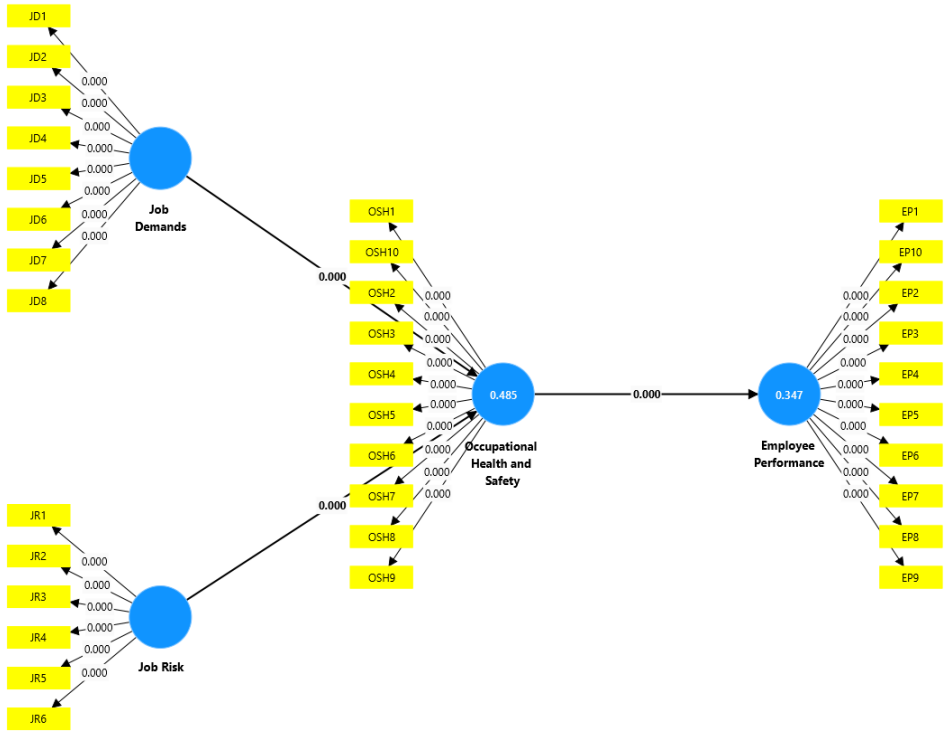

Figure 2 Bootstrapping Test Results

Source: SmartPLS 4.0 Processing Output, 2025

Table 6. Hypothesis Testing Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result
Job Demands -> Occupational Health and Safety	0.421	0.425	0.058	7.288	0.000	Significant
Job Risk -> Occupational Health and Safety	0.385	0.386	0.061	6.306	0.000	Significant
Occupational Health and Safety -> Employee Performance	0.589	0.595	0.059	9.907	0.000	Significant
Job Demands -> Occupational Health and Safety -> Employee Performance	0.248	0.253	0.043	5.771	0.000	Significant
Job Risk -> Occupational Health and Safety -> Employee Performance	0.227	0.230	0.046	4.914	0.000	Significant

Source: SmartPLS 4.0 Processing Output, 2025

Below are the hypothesis testing results on the structural model:

1. The influence of Job Demands on Occupational Health and Safety shows a path coefficient or original sample value of 0.421, which is positive. The statistical test resulted in a T-statistic of 7.288, which is greater than the T-table value of 1.96, and a P-value of 0.000, which is smaller than 0.05. This proves that the hypothesis is accepted, meaning Job Demands have a positive and significant influence on Occupational Health and Safety, where higher job demands will increasingly enhance occupational health and safety.
2. The influence of Job Risk on Occupational Health and Safety has an original sample path coefficient value of 0.385 with a positive relationship direction. Based on the bootstrapping calculation, a T-statistic of 6.306 was obtained, exceeding the T-table limit of 1.96, and a P-value of 0.000, which is below the 0.05 significance level. This result indicates that Job Risk has a positive and significant influence on Occupational Health and Safety, meaning that a tangible increase in work risk will be followed by an improvement in occupational health and safety aspects.
3. The influence of Occupational Health and Safety on Employee Performance records an original sample path coefficient value of 0.589, indicating a positive relationship. From the analysis results, a T-statistic of 9.907 was obtained, which is far greater than the T-table of 1.96, with a P-value of 0.000, which is smaller than 0.05. This data confirms that Occupational Health and Safety has a positive and significant influence on Employee Performance, so the better the implementation of health and safety, the more significant the improvement in employee performance.
4. The indirect influence of Job Demands on Employee Performance via Occupational Health and Safety shows a path coefficient value of 0.248 with a positive direction. Based on statistical testing results, a T-statistic of 5.771 was obtained, which is greater than the T-table value of 1.96, and a P-value of 0.000, which is smaller than 0.05. This proves that Occupational Health and Safety is capable of significantly mediating the relationship between Job Demands and Employee Performance, meaning job demands will impact employee performance improvement if supported by good health and safety mechanisms.
5. The indirect influence of Job Risk on Employee Performance mediated by Occupational Health and Safety produces a path coefficient value of 0.227. Data analysis shows a T-statistic of 4.914, exceeding the T-table limit of 1.96, and a P-value of 0.000, which is below the 0.05 significance level. This result indicates that there is a significant and positive indirect influence, where work risk can affect employee performance through the intermediary of Occupational Health and Safety as an intervening variable.

DISCUSSION

The study identifies a positive and significant correlation between Job Demands and Occupational Health and Safety (OHS). The data indicates that employees at PT. Pertamina Patra Niaga Surabaya Branch who face higher operational pressures also tend to report a more robust implementation of safety standards. This association suggests that the organization likely directs superior safety resources to high-demand units to protect its workforce. Aligned with the Resource-Based View (RBV), this pattern reflects a strategy where employees are treated as "VRIN" (Valuable, Rare, Inimitable, Non-substitutable) assets deserving of prioritized protection (Barney, 1991). This interpretation is consistent with findings by Kim and Bae (2020), Chen et al. (2022), Wang and Zhang (2019), and Lee and Choi (2021), which observe that stricter safety

regulations are often found in sectors with intense work demands to sustain well-being and productivity.

Similarly, Job Risk demonstrates a significant positive association with OHS. The findings reveal that personnel working in environments with elevated risk exposure—ranging from physical hazards to career uncertainty perceive a stronger presence of OHS practices compared to those in lower-risk roles. This implies that the organization strategically fortifies safety defenses in high-risk areas. From an RBV perspective, this correlation highlights OHS as a targeted investment to safeguard critical human assets and ensure operational continuity (Lee & Choi, 2021). These results echo the conclusions of Jia et al. (2023), Li and Fan (2020), Peters et al. (2021), and Singh and Kumar (2022), indicating that high-risk industries tend to concentrate safety efforts where they are needed most to maintain morale and sustainability.

The Influence of Occupational Health and Safety (OHS) on Employee Performance. The findings demonstrate that effective OHS implementation significantly enhances Employee Performance. A strong "safety culture," where employees actively protect one another, creates a psychologically secure environment that allows them to focus on tasks without anxiety. Under the RBV framework, OHS is viewed as an intangible capability that enhances workforce motivation and renders them non-substitutable (Peter & Barney, 2003). Previous literature by Pinder (2021), Zhu and Liu (2023), Gao et al. (2020), and Chen et al. (2021) supports this, confirming that investments in safety correlate with higher individual productivity, timeliness, and operational compliance.

The Mediating Role of OHS between Job Demands and Employee Performance. The empirical evidence confirms that OHS functions as a full mediating variable in the relationship between Job Demands and Employee Performance. This indicates that the influence of high workloads on performance is entirely transmitted through the safety framework. OHS acts as the essential mechanism that converts work pressure into manageable "challenges" rather than overwhelming "threats." Consequently, when a robust safety system is in place, employees can sustain high productivity without experiencing burnout. This finding supports the Resource-Based View (RBV) theory (Barney, 1991), suggesting that OHS capabilities are critical for protecting human assets. Furthermore, studies by Dollard and Bakker (2020), Hassan et al. (2020), Li et al. (2022), and Van den Broeck et al. (2020) corroborate that adequate safety resources are the sole pathway enabling employees to transform high demands into superior engagement and output.

The Mediating Role of OHS between Job Risks and Employee Performance. Similarly, the analysis establishes that OHS acts as a full mediator between Job Risk and Employee Performance. The data suggests that a responsive safety system fully neutralizes the psychological strain associated with operational risks, serving as a protective shield that enables employees to work confidently and with minimal error. In this context, OHS serves as the complete filter that alters the perception of risk from a danger to a controlled variable, thereby turning potential hazards into positive productivity contributions (Wernerfelt, 1984; Barney, 1991). This conclusion is reinforced by Christian et al. (2024), Nahrgang et al. (2021), Harvey et al. (2020), and Probst and Brubaker (2021), who emphasize that a strong safety climate is the requisite condition for mitigating the adverse effects of risk on employee well-being and performance.

CONCLUSIONS

Based on the research results conducted and the data analysis obtained, several conclusions can be drawn as follows:

1. Job Demands have a positive and significant influence on Occupational Health and Safety. The higher the job demands faced by employees at PT. Pertamina Patra Niaga Surabaya Branch, the more it encourages the company to strengthen the implementation of the OHS system. This indicates that the organization responds to high work pressure by increasing safety standards as a protection strategy for human resource assets.
2. Job Risk has a positive and significant influence on Occupational Health and Safety. An increase in the perception of job risks in the field, whether related to physical dangers or career uncertainty, tangibly encourages an increased focus on and implementation of OHS practices. OHS is utilized as a strategic defense mechanism by management to mitigate hazards and ensure operational continuity in a high-risk work environment.
3. Occupational Health and Safety has a positive and significant influence on Employee Performance. Effective OHS implementation that is perceived positively by employees is proven capable of optimally improving individual performance. A safe work environment creates psychological tranquility that enables employees to work with greater focus, productivity, and consistency in producing work volume in accordance with organizational standards.
4. Occupational Health and Safety is able to mediate the relationship between Job Demands and Employee Performance. OHS serves as a vital catalyst that transforms the pressure resulting from high job demands into a positive driver for performance. With adequate safety support, heavy workloads do not become obstacles but rather challenges that can be completed safely, thereby maintaining employee performance.
5. Occupational Health and Safety is able to mediate the relationship between Job Risk and Employee Performance. OHS functions as an effective buffer mechanism in neutralizing the negative impact of job risks on performance. The sense of security created by a strong OHS system is capable of eliminating employee anxiety regarding risks, allowing them to motivate themselves to contribute their best performance without fear.

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