

Effect of Workload and Competence on Employee Performance Mediated by Work Stress Among Employees of PT Andalan Artha Primanusa

Isnasiastuti¹, Yuni Siswanti², Colombanus Ambar Pujiharjanto³

¹⁻³Master of Management Program, Faculty of Economics and Business, Universitas Pembangunan Nasional "Veteran" Yogyakarta

Article Info

Article history:

Received Aug, 2026

Revised Aug, 2026

Accepted Aug, 2026

Kata Kunci:

Beban Kerja, Kompetensi, Stres Kerja, Kinerja Karyawan, PLS-SEM

Keywords:

Workload, Competence, Work Stress, Employee Performance, PLS-SEM

ABSTRAK

Penelitian ini bertujuan untuk menganalisis dan membuktikan pengaruh beban kerja dan kompetensi terhadap kinerja karyawan, dengan stres kerja sebagai variabel mediasi pada karyawan Plant Department PT Andalan Artha Primanusa. Latar belakang penelitian ini didasarkan pada fenomena penurunan pencapaian Key Performance Indicators (KPI) pada fungsi pemeliharaan alat berat selama periode 2024–2025. Penelitian ini menggunakan pendekatan kuantitatif dengan desain eksplanatori. Sampel penelitian berjumlah 100 responden yang dipilih menggunakan teknik purposive sampling. Pengumpulan data dilakukan melalui penyebaran kuesioner dengan skala Likert lima poin, dan data dianalisis menggunakan metode Partial Least Squares–Structural Equation Modeling (PLS-SEM) dengan bantuan perangkat lunak SmartPLS 4. Hasil penelitian menunjukkan bahwa beban kerja berpengaruh negatif dan signifikan terhadap kinerja karyawan, serta berpengaruh positif dan signifikan terhadap stres kerja. Kompetensi terbukti berpengaruh positif dan signifikan terhadap kinerja karyawan, serta berpengaruh negatif dan signifikan terhadap stres kerja. Stres kerja berpengaruh negatif dan signifikan terhadap kinerja karyawan. Hasil pengujian mediasi membuktikan bahwa stres kerja secara signifikan memediasi pengaruh beban kerja dan kompetensi terhadap kinerja karyawan. Temuan ini mendukung Job Demands–Resources (JD-R) Theory, di mana keseimbangan antara tuntutan pekerjaan dan sumber daya pekerjaan sangat memengaruhi tingkat stres dan kinerja karyawan. Perusahaan disarankan mengevaluasi target beban kerja, meningkatkan pengetahuan teknis karyawan secara berkala, dan mengelola kesehatan kerja guna meminimalkan stres dan meningkatkan produktivitas.

ABSTRACT

This study aims to analyze and prove the effect of workload and competence on employee performance, with work stress as a mediating variable among employees of the Plant Department at PT Andalan Artha Primanusa. The background of this research is based on the decline in the achievement of Key Performance Indicators (KPI) for the heavy-equipment maintenance function during the 2024–2025 period. This research uses a quantitative approach with an explanatory design. The sample consisted of 100 respondents selected using a purposive sampling technique. Data were collected through a five-point Likert-scale questionnaire and analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software.

The results show that workload has a significant negative effect on employee performance and a significant positive effect on work stress. Competence has a significant positive effect on employee performance and a significant negative effect on work stress. Work stress has a significant negative effect on employee performance. Mediation testing confirms that work stress significantly mediates the effect of both workload and competence on employee performance. These findings support the Job Demands-Resources (JD-R) Theory, in which the balance between job demands and job resources strongly influences employee stress levels and performance. The company is advised to evaluate workload targets, regularly improve technical knowledge, and manage occupational health to minimize stress and increase productivity.

This is an open access article under the [CC BY-SA](#) license.



Corresponding Author:

Name: Isnasiastuti

Institution: Jl. Padjajaran (Ring Road Utara) No.104, Ngropoh, Condongcatur, Kec. Depok, Kabupaten Sleman, DIY 55283.

Email: isnastuti@gmail.com

1. INTRODUCTION

The mining industry is one of the strategic sectors that contributes significantly to national economic growth by supplying energy and industrial raw materials. Rising demand for mining commodities, particularly coal and nickel, is pushing mining companies to improve productivity, operational efficiency, and heavy-equipment reliability in order to maintain continuity of the production process. In this industry, operational success is determined not only by the availability of technology and equipment, but also by the quality of the human resources who operate and maintain the company's assets. Employee performance therefore becomes a critical factor in determining a company's ability to achieve production targets effectively, efficiently, and sustainably.

In mining contractor companies, the Plant Department plays a strategic role in ensuring that all heavy equipment remains ready for use through inspection, maintenance, and repair activities. The success of this function is reflected in various Key Performance Indicators (KPIs), such as Physical Availability (PA), Mean Time Between Stoppage (MTBS), Mean Time to Stoppage (MTTS), and the proportion of Breakdown Scheduled (BS) and Breakdown Unscheduled (BUS). The achievement of these indicators serves as a benchmark for the effectiveness of heavy-equipment maintenance and reflects the performance of employees in the maintenance unit.

The phenomenon of concern in this study occurred in the Plant Department of PT Andalan Artha Primanusa. Operational data show that during the 2024–2025 period, several heavy-equipment maintenance performance indicators declined. Physical Availability had not reached the company's target, Mean Time Between Stoppage decreased, while Mean Time to Stoppage and the proportion of Breakdown Unscheduled increased. These conditions indicate that the effectiveness of heavy-equipment maintenance has not been optimal and suggest problems in the execution of technicians' work in the field. This situation is thought to be related to high job demands, increasing operational pressure, and the suboptimal competence of some employees in dealing with the complexity of heavy-equipment maintenance work.

From the perspective of Job Demands–Resources Theory (JD-R Theory), every job has two main characteristics: job demands and job resources. Job demands are aspects of work that

continuously require physical or psychological effort, and therefore have the potential to cause fatigue and stress if not balanced by adequate resources. Conversely, job resources are the various resources that help employees complete their work effectively, increase motivation, and sustain performance. In this study, workload is positioned as a job demand, while competence is regarded as a job resource that enables employees to cope with job demands more effectively. Work stress is thus expected to be the psychological mechanism that explains how workload and competence affect employee performance.

The relationship among workload, competence, work stress, and employee performance has been widely studied, yet previous findings remain inconsistent. Masruri and Ekhsan (2022) found that work stress mediates the effect of workload on employee performance, while Raditya and Supartha (2023) likewise found that work stress serves as a significant mediator in this relationship. On the other hand, Nisak (2024) found that the effect of workload on performance is more strongly influenced by job satisfaction and work stress simultaneously, so the mediating mechanism still requires further testing. Regarding the relationship between competence and performance, Sitorus et al. (2022) and Andiani and Jayanagara (2023) demonstrated that competence has a positive effect on performance, whereas Wang et al. (2022) showed that competence plays a greater role in reducing work stress, which subsequently improves performance. These differing results indicate that the mechanism linking workload, competence, work stress, and performance is still inconsistent and therefore needs to be re-examined in different organizational contexts.

In addition to the inconsistency of prior findings, most previous studies have been conducted in the banking, hospital, manufacturing, and government sectors. Research testing the relationship among workload, competence, work stress, and employee performance in mining contractor companies remains very limited, even though this industry has distinct job characteristics, such as the use of heavy equipment, shift-work systems, high production targets, and substantial occupational safety risks. As a result, findings from other sectors cannot necessarily be generalized to the mining contractor industry. This study therefore fills this literature gap by re-examining the relationship among workload, competence, work stress, and employee performance in the Plant Department of PT Andalan Artha Primanusa using the Job Demands–Resources (JD-R) Theory as its conceptual foundation.

Unlike previous studies that generally examine relationships between variables partially in the service, manufacturing, or public-service sectors, this study integrates workload as a job demand, competence as a job resource, and work stress as a mediating mechanism within a single research model in a mining contractor company. This model is expected to provide a more comprehensive understanding of the mechanisms affecting employee performance in a work environment with high operational demands.

Based on this phenomenon and research gap, this study offers both theoretical and practical contributions. Theoretically, this study extends the application of Job Demands–Resources (JD-R) Theory to the context of the mining contractor industry by examining the role of work stress as a mediating variable in the relationship between job demands (workload), job resources (competence), and employee performance. Practically, the findings are expected to provide an empirical basis for the management of PT Andalan Artha Primanusa in formulating policies on workload management, technician competence development, and work-stress control programs to improve the effectiveness of heavy-equipment maintenance and the achievement of Key Performance Indicators (KPIs). This study therefore aims to analyze the effect of workload and competence on employee performance, both directly and indirectly through work stress as a mediating variable, among employees of the Plant Department of PT Andalan Artha Primanusa. The findings are expected to enrich the human resource management literature, particularly regarding the application of JD-R Theory in the mining industry, while providing evidence-based recommendations for the company in designing strategies to improve employee performance.

2. LITERATURE REVIEW

2.1 Job Demands–Resources (JD-R) Theory

This study uses Job Demands–Resources (JD-R) Theory as the conceptual foundation to explain the relationship among workload, competence, work stress, and employee performance. According to JD-R Theory, every job has two main characteristics: job demands and job resources. Job demands are aspects of work that continuously require physical or psychological effort and therefore have the potential to cause fatigue and work stress if not balanced by adequate resources. Conversely, job resources are resources that help employees achieve work goals, reduce the impact of job demands, and increase motivation and performance. In this study, workload is positioned as a job demand, while competence is regarded as a job resource that helps employees complete their work effectively. Work stress is therefore positioned as the psychological mechanism that explains the relationship among job demands, job resources, and employee performance.

2.2 Hypothesis Development

Effect of Workload on Employee Performance

Workload is one of the job demands that can affect an employee's ability to complete tasks optimally. Based on JD-R Theory, an increase in job demands that is not balanced by adequate resources will drain employees' energy, thereby reducing both the quality and quantity of work output. A number of studies show that excessive workload tends to reduce performance because it causes physical and psychological fatigue. Based on this reasoning, the hypothesis proposed is:

H1: Workload has a negative effect on employee performance.

2.2.1 Effect of Competence on Employee Performance

Competence reflects the knowledge, skills, and individual characteristics that enable employees to carry out their work effectively. From the perspective of JD-R Theory, competence is a job resource that helps individuals cope with job demands, thereby improving productivity and the quality of work output. Various studies show that employees with high competence tend to produce better performance than employees with lower competence. Therefore, the hypothesis proposed is:

H2: Competence has a positive effect on employee performance.

2.2.2 Effect of Workload on Work Stress

According to JD-R Theory, a continuous increase in job demands can lead to psychological pressure that results in work stress. Workload that exceeds an individual's capacity reduces energy and increases the pressure involved in completing tasks. Previous research consistently shows that the higher the workload, the higher the level of work stress experienced by employees. Based on this explanation, the hypothesis proposed is:

H3: Workload has a positive effect on work stress.

2.2.3 Effect of Competence on Work Stress

Adequate competence enables employees to manage job demands more effectively, thereby suppressing the emergence of work stress. Individuals with a high level of competence generally have better problem-solving ability, decision-making ability, and technical mastery, making them better able to cope with work pressure. Therefore, the hypothesis proposed is:

H4: Competence has a negative effect on work stress.

2.2.4 Effect of Work Stress on Employee Performance

Excessive work stress can reduce an individual's concentration, motivation, and ability to complete tasks, thereby leading to a decline in performance. In JD-R Theory, work stress is a consequence of high job demands that subsequently affects job outcomes. Previous research also shows that increasing work stress tends to be followed

by a decline in employee performance. Based on this reasoning, the hypothesis proposed is:

H5: Work stress has a negative effect on employee performance.

2.2.5 The Mediating Role of Work Stress

JD-R Theory explains that job demands and job resources affect performance not only directly, but also through psychological processes, one of which is work stress. High workload has the potential to increase stress, thereby reducing performance, while high competence can reduce stress, thereby positively affecting performance. Work stress is thus expected to be a mediating mechanism in the relationship between workload and competence on employee performance. Based on this explanation, the hypotheses proposed are:

H6: Work stress mediates the effect of workload on employee performance.

H7: Work stress mediates the effect of competence on employee performance.

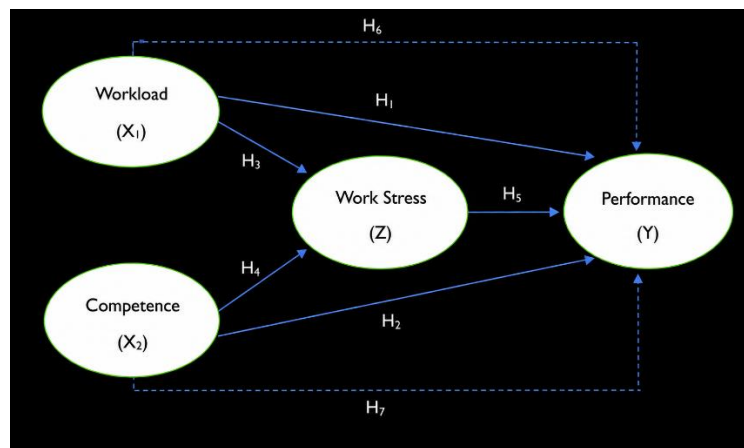


Figure 1. Research Framework

3. RESEARCH METHODS

This study uses a quantitative approach with an explanatory research design to test the causal effects among variables through structured measurement and statistical analysis. Data were collected through a questionnaire survey using a five-point Likert scale and analyzed using Partial Least Squares-based Structural Equation Modeling (SEM-PLS) with the aid of SmartPLS 4, because this method is able to simultaneously analyze complex patterns of causal relationships with a relatively moderate sample size and does not require strict data-distribution assumptions (Hair et al., 2022).

The object of this research is employees of the Plant Department of PT Andalan Artha Primanusa, the work unit responsible for the maintenance, upkeep, and repair of heavy equipment. The research population consisted of 150 people. The sample was determined using a purposive sampling technique, yielding 100 respondents who met the research criteria, a number that satisfies the recommendation of Hair et al. (2022) for SEM-PLS analysis. The sample distribution consisted of Mechanics/Technicians (70 people), Foremen (15 people), Supervisors (10 people), and other positions (5 people).

This study involves four variables: Workload (X₁) and Competence (X₂) as independent (exogenous) variables, Work Stress (Z) as the mediating (intervening) variable, and Employee Performance (Y) as the dependent (endogenous) variable. A summary of the operational definitions of the variables is presented in Table 1.

Table 1. Operational Definitions of Research Variables

Variable	Definition	Dimensions/Main Indicators	No. of Items
Workload (X1)	The amount of work/activity that must be completed by workers within a certain period of time according to their physical and mental abilities (Tarwaka, 2015).	Physical load, mental load, time load	9
Competence (X2)	Ability comprising the knowledge, skills, and work attitude required to perform tasks according to organizational standards (Sedarmayanti, 2017).	Knowledge, skill, self-concept/work attitude	9
Work Stress (Z)	A dynamic condition in which an individual faces demands, opportunities, or constraints related to the job, the outcome of which is considered important but uncertain (Robbins & Judge, 2022).	Physiological, psychological, behavioral	12
Employee Performance (Y)	The behavior or actions of an individual in carrying out work relevant to organizational goals (Campbell, McHenry, & Wise, 1990).	Quality, quantity, timeliness, effectiveness	13

Source: Processed From The Research Instrument (Likert Scale Questionnaire 1–5).

Data analysis was carried out through the following stages: (1) descriptive statistical analysis; (2) measurement model (outer model) evaluation, comprising convergent validity (outer loading ≥ 0.70 and AVE ≥ 0.50) and discriminant validity (HTMT < 0.90), as well as reliability testing using Composite Reliability and Cronbach's Alpha (≥ 0.70); (3) structural model (inner model) evaluation, comprising the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2); and (4) hypothesis testing and mediation-effect testing through the bootstrapping procedure, with acceptance criteria of t-statistic > 1.96 and p-value < 0.05 at a 5% significance level (Hair et al., 2022).

4. RESULTS AND DISCUSSION

4.1 Respondent Characteristics

Respondents were predominantly male (96%), aged 25–29 years (41%), with the largest proportion holding the position of field Mechanic/Technician (60%). This composition reflects the characteristics of the Plant Department workforce, most of whom are involved in operational and heavy-equipment maintenance activities, so the respondent characteristics are consistent with the object of the research.

4.2 Descriptive Analysis of Variables

The descriptive analysis results show that respondents' perceptions of workload fall into the high category, with the highest score on the time-load indicator (mean 3.80), followed by mental load (3.76) and physical load (3.72), indicating that time pressure in completing work is still perceived as considerable by employees. For the competence variable, all indicators fall into the high category, although the knowledge indicator has a relatively lower score than the other indicators, suggesting that employees' understanding of heavy-equipment functions and maintenance procedures still needs to be improved. For the work-stress variable, the physiological indicator obtained the highest average score (2.88), indicating that physical symptoms such as fatigue and headaches are still experienced by some employees.

4.3 Measurement Model Evaluation (Outer Model)

The outer loading test results show that most indicators have values above 0.70 (range 0.614–0.843), with a few indicators in the 0.60–0.70 range retained because the AVE and Composite

Reliability values of the constructs already meet the criteria (Hair et al., 2022). The Average Variance Extracted (AVE) and Composite Reliability (CR) values for each construct are presented in Table 2.

Table 2. Convergent Validity and Reliability Test Results

Variable	Outer Loading Range	AVE	Cronbach's Alpha	Composite Reliability	Remarks
Workload (X1)	0.694–0.789	0.534	0.891	0.911	Valid & Reliable
Competence (X2)	0.614–0.828	0.501	0.875	0.900	Valid & Reliable
Work Stress (Z)	0.673–0.826	0.584	0.935	0.944	Valid & Reliable
Employee Performance (Y)	0.685–0.843	0.590	0.942	0.949	Valid & Reliable

Source: SmartPLS 4 Output, Processed (2026).

All constructs have AVE values above 0.50 and Composite Reliability and Cronbach's Alpha values above 0.70, so all constructs are declared valid and reliable. The discriminant validity test using the Fornell-Larcker and HTMT criteria also shows that each construct is clearly distinct from the others (HTMT values < 0.90), so the measurement model is suitable for use in structural model analysis.

4.4 Structural Model Evaluation (Inner Model)

Table 3. Coefficient of Determination (R^2)

Endogenous Variable	R-Square	R-Square Adjusted	Category
Work Stress (Z)	0.519	0.509	Moderate
Employee Performance (Y)	0.741	0.732	Strong

Source: SmartPLS 4 Output, Processed (2026).

The R^2 value shows that 51.9% of the variation in Work Stress is explained by Workload and Competence (moderate category), while 74.1% of the variation in Employee Performance is explained by Workload, Competence, and Work Stress (strong category), indicating that the structural model has good ability to explain the variation in the endogenous variables.

Table 4. Effect Size (f^2)

Relationship Between Variables	f^2	Category
Workload (X1) → Work Stress (Z)	0.768	Large
Competence (X2) → Work Stress (Z)	0.214	Moderate
Workload (X1) → Employee Performance (Y)	0.143	Small
Competence (X2) → Employee Performance (Y)	0.408	Large
Work Stress (Z) → Employee Performance (Y)	0.427	Large

Source: SmartPLS 4 Output, Processed (2026).

Workload provides the largest contribution to work stress ($f^2 = 0.768$; large), while competence and work stress both have a large effect on employee performance. The direct effect of workload on performance is classified as small ($f^2 = 0.143$), indicating that in this research model, the

effect of workload on performance is more meaningful through changes in the level of work stress than through its direct effect.

4.5 Hypothesis Testing

Table 5. Results of Direct and Indirect Effect Testing

Hypothesis	Relationship Between Variables	Path Coef. (O)	t-statistic	p-value	Decision
H1	Workload (X1) → Employee Performance (Y)	-0.258	4.108	0.000	Accepted
H2	Competence (X2) → Employee Performance (Y)	0.361	6.040	0.000	Accepted
H3	Workload (X1) → Work Stress (Z)	0.611	10.526	0.000	Accepted
H4	Competence (X2) → Work Stress (Z)	-0.323	4.764	0.000	Accepted
H5	Work Stress (Z) → Employee Performance (Y)	-0.480	7.588	0.000	Accepted
H6	Workload (X1) → Work Stress (Z) → Performance (Y)	-0.293	5.792	0.000	Accepted
H7	Competence (X2) → Work Stress (Z) → Performance (Y)	0.155	4.066	0.000	Accepted

Source: SmartPLS 4 Bootstrapping Output, Processed (2026).

All relationships among the variables, both direct and indirect, have a p-value of 0.000 (< 0.05), so all hypotheses (H1–H7) are declared accepted. Workload is proven to have a negative effect on employee performance but a positive effect on work stress; competence has a positive effect on employee performance and a negative effect on work stress; work stress has a negative effect on employee performance; and work stress is proven to significantly mediate the effect of both workload and competence on employee performance.

Discussion

Effect of Workload on Employee Performance (H1). The test results show that workload has a significant negative effect on employee performance ($\beta = -0.258$; $t = 4.108$; $p = 0.000$). This finding indicates that the higher the workload received by employees of the Plant Department of PT Andalan Artha Primanusa, the lower the resulting performance. This can be explained by the fact that technicians are not only required to complete heavy-equipment maintenance work according to a time target, but must also ensure repair quality, work safety, and equipment readiness so that it can quickly return to operation. Pressure to meet production targets, the high frequency of maintenance work, and the occurrence of unscheduled breakdowns increase employees' physical and mental load, thereby reducing their ability to work optimally.

This finding is consistent with Job Demands–Resources (JD-R) Theory, which states that workload is a job demand. When job demands exceed an individual's capacity and are not balanced by adequate job resources, physical and psychological energy becomes depleted, triggering a health impairment process that leads to a decline in performance. Thus, a high workload not only affects productivity but also reduces accuracy, the speed of decision-making, and the quality of work completion.

These results are consistent with the findings of Nisak (2024), Pangabea et al. (2024), Raditya and Supartha (2023), Sitorus et al. (2022), and Andiani and Jayanagara (2023), which show that workload has a negative effect on employee performance. This consistency indicates that the negative effect of workload on performance occurs across various sectors, including the mining contractor industry, which is characterized by high-risk work, the use of heavy equipment, and strict operational targets.

This finding shows that workload management in the mining contractor industry is not only related to productivity, but is also part of a strategy to maintain the sustainability of company operations, as it is directly related to equipment readiness.

The practical implication of this finding is that companies need to evaluate the distribution of workload, adjust the number of workers during periods of high work intensity, and arrange more effective maintenance schedules. These efforts are expected to reduce excessive work pressure so that technicians' performance remains optimal without neglecting occupational safety.

Effect of Competence on Employee Performance (H2). The research results show that competence has a significant positive effect on employee performance ($\beta = 0.361$; $t = 6.040$; $p = 0.000$). This finding indicates that increasing competence improves technicians' ability to complete work effectively, on time, and in accordance with operational standards. In the Plant Department, competence is an important factor because heavy-equipment maintenance work requires mastery of technical knowledge, diagnostic skills, and the ability to make decisions when facing complex damage.

Based on JD-R Theory, competence is a job resource that helps employees cope with job demands. Employees with high competence are able to use their knowledge and skills to complete work more efficiently, thereby reducing the pressure caused by job complexity and maintaining performance. In other words, competence not only improves technical ability but also strengthens an individual's capacity to face various operational challenges.

These results support Spencer and Spencer (1993), Sitorus et al. (2022), and Andiani and Jayanagara (2023), who state that competence is an important determinant of improved performance. In the context of mining contractor companies, these results indicate that company investment in technical training, certification, and Competency Matrix evaluation will have a direct impact on improving the productivity and effectiveness of heavy-equipment maintenance.

This finding shows that improving competence functions not only as an individual development effort, but also as a strategic company investment in maintaining operational reliability. In mining contractor companies, technicians' competence determines the accuracy of damage diagnosis, repair quality, and the speed with which heavy equipment is returned to a ready-to-operate condition. Therefore, strengthening competence adds value that is reflected not only in improved individual performance, but also in the effectiveness of the company's overall operational process.

The practical implication is that companies need to strengthen competence-development programs through regular training, knowledge sharing, and technical certification so that technicians' abilities continue to develop in line with the increasing complexity of heavy-equipment technology.

Effect of Workload on Work Stress (H3). The research results show that workload has a significant positive effect on work stress ($\beta = 0.611$; $t = 10.526$; $p = 0.000$). The magnitude of the effect size indicates that workload is the most dominant factor in increasing work stress among Plant Department employees. This condition indicates that the demand to complete work within a limited time, the high frequency of breakdowns, and the responsibility of maintaining equipment readiness are sources of pressure felt by employees.

From the perspective of JD-R Theory, an increase in job demands will deplete an individual's physical and psychological resources, triggering a health impairment process. If this condition continues without adequate resource support, the level of work stress will continue to increase. Therefore, this finding shows that work stress is a logical consequence of the high job demands faced by technicians.

These results are consistent with Masruri and Ekhsan (2022), Nisak (2024), and Raditya and Supartha (2023). This similarity of results reinforces the empirical evidence that workload is one of the main determinants of work stress across various sectors, including the mining contractor industry.

This finding shows that workload management in mining contractor companies is an important part of the human resource management strategy. High work stress not only affects employees' psychological condition but also has the potential to increase work errors, reduce compliance with safety procedures, and disrupt the smoothness of heavy-equipment maintenance activities. Therefore, controlling workload is a preventive step in maintaining both safety and the company's operational effectiveness.

This finding suggests that companies need to control workload through a more even distribution of work, adjustment of work schedules, and the provision of an adequate workforce to minimize the risk of work stress.

Effect of Competence on Work Stress (H4). The research results show that competence has a significant negative effect on work stress ($\beta = -0.323$; $t = 4.764$; $p = 0.000$). This finding indicates that the higher the competence possessed by employees of the Plant Department of PT Andalan Artha Primanusa, the lower the level of work stress they experience. This can be explained by the fact that heavy-equipment maintenance work requires technical ability, accuracy, and speed in identifying and resolving various problems with equipment units. Employees who have adequate knowledge, skills, and experience tend to be more confident in facing job demands, so the psychological pressure that arises during the work process can be minimized.

From the perspective of Job Demands–Resources (JD-R) Theory, competence is a job resource that functions as an internal resource for individuals in facing job demands. Adequate job resources enable employees to manage work pressure more effectively, thereby reducing the likelihood of work stress. Competence thus not only improves the ability to complete work but also strengthens an individual's ability to adapt to changing operational conditions and job complexity in the mining environment.

These results are consistent with Wang et al. (2022), Sitorus et al. (2022), and Andiani and Jayanagara (2023), who state that competence plays an important role in reducing the level of work stress. This similarity of results indicates that competence is a protective factor that helps employees cope with job pressure across various sectors. In the context of mining contractor companies, competence becomes increasingly important because the work environment has a high level of risk, complex heavy-equipment technology, and strict operational targets.

This finding shows that competence has a broader function than merely improving technical ability. In a highly complex work environment, competence becomes a psychological resource that helps employees face job pressure with greater confidence. Competence development can thus be viewed as an organizational strategy for increasing employees' resilience to job pressure while creating a healthier and more productive work environment.

The practical implication of this finding is that companies need to enhance competence-development programs through regular technical training, Competency Matrix evaluation, certification programs, and knowledge sharing. Improved competence is expected not only to enhance employees' technical ability but also to reduce work stress, so that productivity and occupational safety can be maintained.

Effect of Work Stress on Employee Performance (H5). The research results show that work stress has a significant negative effect on employee performance ($\beta = -0.480$; $t = 7.588$; $p = 0.000$), with a large effect size. This finding indicates that an increase in work stress will be followed by a decline in the performance of Plant Department employees of PT Andalan Artha Primanusa. High job pressure can reduce concentration, accuracy, and employees' ability to make quick and precise decisions when carrying out heavy-equipment maintenance or repair. If this condition continues, work productivity will decline, and the risk of work errors and equipment breakdowns has the potential to increase.

Based on Job Demands–Resources (JD-R) Theory, work stress is a consequence of high job demands that are not balanced by adequate job resources. This condition triggers a health impairment process, namely a process of declining physical and psychological condition that affects

motivation, work effectiveness, and the quality of work output. Work stress is thus an important mechanism explaining how job pressure ultimately affects employee performance.

These findings are consistent with Chen et al. (2022), Anggraini et al. (2023), Conceição and Palma-Moreira (2025), and Andiani and Jayanagara (2023), which show that work stress has a negative effect on employee performance. This similarity of results reinforces the evidence that managing work stress is an important aspect of maintaining productivity in various types of organizations, including mining contractor companies.

This finding confirms that managing work stress is a strategic factor in maintaining employee performance in the mining industry. A decline in performance due to stress not only affects individual productivity but also has the potential to affect the quality of equipment maintenance, the timeliness of work completion, and the continuity of production activities. Therefore, work-stress management needs to be positioned as part of an organizational performance-improvement strategy, not merely an employee welfare program.

The practical implication of these findings is that companies need to develop work-stress management programs through a more balanced arrangement of working and rest hours, regular health checks, and the strengthening of Occupational Health and Safety (K3) programs. These steps are expected to maintain employees' physical and psychological condition so that performance can be sustained optimally.

The Mediating Role of Work Stress in the Effect of Workload on Performance (H6). The research results show that work stress significantly mediates the effect of workload on employee performance ($\beta = -0.293$; $t = 5.792$; $p = 0.000$). This finding indicates that the effect of workload on performance occurs not only directly, but also through an increase in the level of work stress experienced by employees. In other words, the higher the workload received by employees, the higher the level of work stress they feel, and this condition ultimately reduces employee performance. This indicates that work stress is a psychological mechanism that explains how job demands affect the achievement of performance.

From the perspective of Job Demands–Resources (JD-R) Theory, high job demands will deplete an individual's physical and psychological energy, triggering a health impairment process. This process leads to increased work stress, which ultimately results in a decline in performance. This finding therefore reinforces the assumption of JD-R Theory that the effect of job demands on performance is not always direct, but can occur through employees' psychological condition as a mediating variable.

This finding is in line with Nisak (2024) and Raditya and Supartha (2023), who state that work stress mediates the relationship between workload and employee performance. However, this result differs from Masruri and Ekhsan (2022), who did not find such a mediating role. This difference in results is thought to be caused by differences in respondent characteristics, industry type, level of job complexity, and organizational conditions that were the object of the research. In the mining contractor industry, higher job demands and greater operational risk cause work stress to play a more dominant role in explaining the relationship between workload and performance.

This finding shows that the negative impact of workload on performance cannot be explained solely by the magnitude of job demands, but also through the psychological condition experienced by employees. In other words, a company's success in maintaining performance cannot be achieved solely through workload management, but also through efforts to reduce work stress as the mechanism bridging this relationship. This finding enriches the understanding of the process underlying the decline in performance in the context of the mining contractor industry, which has high operational demands.

The practical implication of this finding is that it is not enough for companies to merely reduce workload; they also need to manage the psychological impact caused by that workload. Work-stress management programs, a more proportional arrangement of workload, and the provision of organizational support are expected to break the mechanism that causes a decline in performance due to increasing work stress.

The Mediating Role of Work Stress in the Effect of Competence on Performance (H7). The research results show that work stress significantly mediates the effect of competence on employee performance ($\beta = 0.155$; $t = 4.066$; $p = 0.000$). This finding indicates that competence improves performance not only directly, but also through its ability to reduce the level of work stress. The higher the competence possessed by employees, the greater their ability to understand work procedures, identify equipment damage, and make appropriate decisions, so that the job pressure they feel becomes lower and performance can improve.

Based on Job Demands–Resources (JD-R) Theory, competence is a job resource that is able to reduce the negative impact of job demands. Employees with high competence tend to be better prepared to face job demands, so that work stress can be suppressed and work energy can be directed toward increasing productivity. This finding reinforces the view that job resources affect performance not only directly, but also through the psychological mechanism of reduced work stress.

These results support Wang et al. (2022), Andiani and Jayanagara (2023), Sitorus et al. (2022), and Anggraini et al. (2023), who show that competence is able to improve performance through a reduction in the level of work stress. This similarity of results indicates that competence has a strategic function as a factor that strengthens an individual's ability to face job demands in various organizational contexts, including the mining contractor industry.

This finding shows that the benefit of competence does not stop at the direct improvement of work ability, but also extends to its ability to suppress the level of work stress. This result indicates that competence development provides a dual benefit, namely improving technical capacity while also strengthening employees' psychological readiness to face job demands. Company investment in competence development can therefore have a more sustainable impact on performance improvement compared with focusing solely on improving technical skills.

The practical implication of this study is that companies need to make competence development a long-term strategy for improving employee performance. Training, certification, coaching, and career-development programs will not only improve technical ability but also help reduce work stress, thereby having a positive impact on productivity and the sustainability of company operations.

5. CONCLUSION

This study aims to analyze the effect of workload and competence on employee performance with work stress as a mediating variable among employees of the Plant Department of PT Andalan Artha Primanusa. The results show that workload has a negative effect on employee performance and a positive effect on work stress. Conversely, competence has a positive effect on performance and a negative effect on work stress. These findings indicate that high workload tends to increase psychological pressure, which ultimately reduces performance, while good competence helps employees cope with job demands more effectively, thereby improving performance while also suppressing the level of work stress.

In addition to the direct effects, this study also proves that work stress acts as a mediating variable in the relationship between workload and competence on employee performance. These results show that the effect of both workload and competence on performance occurs not only directly, but also through employees' psychological condition. Proportional workload management and continuous competence development are therefore important factors in keeping the level of work stress at an optimal level so as to improve employee performance.

Overall, this study confirms that the balance between job demands and job resources is an important mechanism in explaining employee performance in mining contractor companies. These findings provide empirical support for the application of Job Demands–Resources (JD-R) Theory, which explains that high job demands in the form of workload can increase work stress and reduce performance (health impairment process), while job resources in the form of competence are able to

improve performance while also reducing work stress. This study thus extends the empirical evidence on the application of JD-R Theory in the context of mining contractor companies, which is still relatively limited in the human resource management literature.

REFERENCES

- Andiani, T. K., & Jayanagara, O. (2023). Effect of workload, work stress, technical skills, self-efficacy, and social competence on medical personnel performance. *Aptisi Transactions on Technopreneurship (ATT)*, 5(2), 205–218. <https://doi.org/10.34306/att.v5i2.301>
- Anggraini, D., Nasution, M. I., & Prayogi, M. A. (2023). Optimalisasi kinerja pegawai: Stres kerja dan kualitas kehidupan kerja dengan mediasi kepuasan kerja. *Jurnal Manajemen dan Bisnis*, 24(2), 170–198.
- Armstrong, M., & Taylor, S. (2023). *Armstrong's handbook of human resource management practice* (16th ed.). Kogan Page.
- Bakker, A. B., & Demerouti, E. (2007). The Job Demands–Resources model: State of the art. *Journal of Managerial Psychology*, 22(3), 309–328. <https://doi.org/10.1108/02683940710733115>
- Boyatzis, R. E. (2008). Competencies in the 21st century. *Journal of Management Development*, 27(1), 5–12. <https://doi.org/10.1108/02621710810840730>
- Campbell, J. P., McHenry, J. J., & Wise, L. L. (1990). Modeling job performance in a population of jobs. *Personnel Psychology*, 43(2), 313–333.
- Chen, B., Wang, L., Li, B., & Liu, W. (2022). Work stress, mental health, and employee performance. *Frontiers in Psychology*, 13, Article 1006580. <https://doi.org/10.3389/fpsyg.2022.1006580>
- Conceição, A., & Palma-Moreira, A. (2025). The relationship between occupational stress, burnout, and perceived performance: The moderating role of work regime. *International Journal of Environmental Research and Public Health*.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). Sage Publications.
- Kasmir. (2019). *Manajemen sumber daya manusia (Teori dan praktik)*. RajaGrafindo Persada.
- Mangkunegara, A. A. P. (2017). *Manajemen sumber daya manusia perusahaan*. PT Remaja Rosdakarya.
- Masruri, A., & Ekhsan, M. (2022). Peran stres kerja sebagai mediasi pada pengaruh beban kerja terhadap kinerja karyawan. *Eqien-Jurnal Ekonomi dan Bisnis*, 11(1), 753–761. <https://doi.org/10.34308/eqien.v11i1.792>
- Mathis, R. L., & Jackson, J. H. (2011). *Human resource management (Edisi Terjemahan)*. Salemba Empat.
- Munandar, A. S. (2014). *Psikologi industri dan organisasi*. UI Press.
- Nisak, N. A. (2024). Pengaruh beban kerja dan kepuasan kerja terhadap kinerja dengan mediasi stres kerja. *Jurnal Kepemimpinan dan Inovasi*, 3(1), 35–49.
- Pangabean, R. K., Junita, A., & Miraza, Z. (2024). The impact of stress and workload on performance moderated by work shift. *Jurnal Administrasi Bisnis*, 13(1), 19–30. <https://doi.org/10.14710/jab.v13i1.54614>
- Raditya, C. G., & Supartha, W. G. (2023). Job stress mediate: Workload on employee performance. *World Journal of Advanced Research and Reviews (WJARR)*, 17(1), 560–570. <https://doi.org/10.30574/wjarr.2023.17.1.1774>
- Robbins, S. P., & Judge, T. A. (2022). *Perilaku organisasi (Edisi Terjemahan)*. Salemba Empat.
- Sedarmayanti. (2017). *Manajemen sumber daya manusia: Reformasi birokrasi dan manajemen pegawai negeri sipil*. PT Refika Aditama.
- Siswanti, Y., dkk. (2019). *Manajemen sumber daya manusia*. UPN Veteran Yogyakarta Press.
- Sitorus, S. A., Suwitho, Haditomo, A. H. C., Nurfaidah, R., Ramlawati, Hendarto, T., & Hermawati, A. (2022). The influence of workload and competency on organizational performance with organizational culture mediation. *Jurnal Aplikasi Manajemen*, 20(2), 304–315. <https://doi.org/10.21776/ub.jam.2022.020.02.08>
- Spencer, L. M., & Spencer, S. M. (1993). *Competence at work: Models for superior performance*. John Wiley & Sons.
- Subyantoro, A., & Suwandi. (2019). *Metode penelitian kuantitatif*. UPN Veteran Yogyakarta Press.
- Sutrisno, E. (2019). *Manajemen sumber daya manusia*. Kencana Prenada Media Group.
- Tarwaka. (2015). *Ergonomi industri: Dasar-dasar pengetahuan ergonomi dan aplikasi di tempat kerja*. Harapan Press.
- Wang, C., Xu, J., Zhang, T., Li, Q., Zhao, Y., & Chen, H. (2022). The effect of employee competency and organizational culture on employees' perceived stress for better workplace. *International Journal of Environmental Research and Public Health*, 19(8), Article 4428. <https://doi.org/10.3390/ijerph19084428>
- Wibowo. (2016). *Manajemen kinerja (Edisi Kelima)*. PT RajaGrafindo Persada.