

The Influence of Work Stress and Workload on the Performance of Response Team Employees (Case Study at the Cirebon Regency Fire Department)

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Abstract

This study examines how work stress and workload affect the performance of firefighting officers (Response Team) in Cirebon Regency, an institution whose employees work 24-hour shifts covering a wide geographical area with limited personnel. The study involved 93 of 120 Response Team officers using a Likert 1–5 scale questionnaire analyzed with IBM SPSS Statistics. Results show that higher work stress significantly decreases employee performance ($\beta = -0.381$, $t = -2.658$, $p = 0.009$). Workload within a reasonable range has a positive and significant effect on performance ($\beta = 0.476$, $t = 2.954$, $p = 0.004$). Simultaneously, both variables significantly influence employee performance ($F = 4.451$, $p = 0.014$), explaining 9.1% of the performance variation. It is recommended that the Fire Department implement stress reduction programs, psychological support, and balanced workload management to improve the performance and welfare of emergency service officers.

Keywords: *Work Stress; Workload; Employee Performance; Firefighting Officers.*

1. Introduction

In the era of bureaucratic reform and modern organizational dynamics, the success of a government agency greatly depends on the quality of its human resources (HR) as the main driving force. The Fire Department (Damkar) of Cirebon Regency is a vital public institution whose employees particularly the Response Team — are required to maintain peak physical and mental readiness when facing emergency situations. Covering an area of approximately 1,087.64 km², the Response Team faces critical operational challenges including vast coverage areas, diverse emergency call types, and fluctuating workloads during peak seasons (Sari et al., 2022).

One of the determinant factors consistently affecting field performance is workload, defined as the gap between an employee's capacity and the demands of tasks to be completed

within a certain period. Response Team members carry out physically demanding operations — entering hazardous areas with equipment weighing 30–50 kg, conducting evacuations, and enduring extreme temperatures above 60°C — while maintaining 24-hour standby rotations that disrupt circadian rhythms and cause cumulative fatigue (Farial Balqis, 2020).

Beyond physical demands, Response Team officers also experience high psychological stress from unrealistic public expectations, traumatic field experiences, and exposure to casualties. Work stress, if left unmanaged, progressively erodes intrinsic motivation, reduces operational focus, and leads to burnout — ultimately resulting in significant performance decline (Mardiani & Khamdanah, 2022). This study aims to empirically examine the influence of work stress and workload on the performance of Response Team officers at the Cirebon Regency Fire Department.

2. Literature Review

Work Stress

Work stress is defined as a dynamic condition in which an individual faces opportunities, demands, or resources whose outcomes are perceived as uncertain yet important (Robbins & Judge, 2017). Operationally, work stress creates an imbalance that affects emotions, thinking, and physical condition. Based on Selye's (1956) General Adaptation Syndrome, prolonged stress progresses through alarm, resistance, and exhaustion phases. Mardiani and Khamdanah (2022) found that work stress negatively affects employee performance, with uncontrolled pressure reducing employees' ability to complete tasks. Indicators include task demands, role demands, interpersonal demands, organizational structure, and organizational leadership style.

Workload

Workload refers to the set of activities that must be completed by an organizational unit within a given period (Dhania, 2010). Hart and Staveland's (1988) Workload Theory explains that workload involves both mental and physical capacity demands influenced by external factors (task requirements, work environment) and internal factors (motivation, individual perception). Research shows varied results: Farial Balqis (2020) and Mangowal et al. (2024) found workload positively affects performance, while Mardiani and Khamdanah (2022) found excessive workload negatively affects performance. Indicators include targets to be achieved, work conditions, time utilization, work standards, and emergency operation frequency.

Employee Performance

Employee performance is defined as the work results — in terms of quality and quantity — achieved by an employee in carrying out responsibilities (Mangkunegara, 2017). Robbins (2016) adds that performance is a function of ability, motivation, and opportunity. Performance indicators in this study comprise quality of work, quantity of work, timeliness, effectiveness, and independence (Bernadin & Russell, 1993).

Hypothesis Development

Based on the theoretical and empirical reviews above, the hypotheses of this study are formulated as follows:

H1: Work Stress (X_1) has a significant negative effect on Employee Performance (Y) of the Response Team at Cirebon Regency Fire Department.

H2: Workload (X_2) has a significant positive effect on Employee Performance (Y) of the Response Team at Cirebon Regency Fire Department.

H3: Work Stress (X_1) and Workload (X_2) simultaneously have a significant effect on Employee Performance (Y) of the Response Team at Cirebon Regency Fire Department.

3. Methodology Of Research

Research Design and Variables

This study employs an associative quantitative approach to analyze relationships among variables (X_1 , X_2 , and Y) and to test whether the independent variables significantly influence the dependent variable. The quantitative approach was chosen because it enables the collection of numerical data that can be analyzed statistically to test pre-established hypotheses (Sugiyono, 2013). The study consists of two independent variables — Work Stress (X_1) and Workload (X_2) — and one dependent variable, Employee Performance (Y).

Table 1. Operational Definitions of Variables and Indicators

Variable	Operational Definition	Dimensions	Indicators	Scale
Work Stress (X_1)	The pressure experienced in the workplace that affects the physical and mental health of workers and can disrupt their performance (Awang Sofyan, 2019).	Workload; work relationships; working hours; conflict; work authority	Excessive perceived workload; disagreement with colleagues; excessive working hours; employee–supervisor conflict; work authority and responsibilities	Likert 1–5
Workload (X_2)	The totality of physical and psychological activities that must be completed within a certain period, many of which require advanced cognitive abilities (Batubara & Abadi, 2022).	Targets to be achieved; work conditions; time utilization; work environment	Complexity level; overtime hours; responsibilities; tasks not matching expertise; work conditions	Likert 1–5
Employee Performance (Y)	The totality of employee achievements in dedicating their full capabilities to obtain the best results by considering quantity and quality to achieve	Work quantity; work quality; timeliness; attendance; teamwork	Output per working hour; work per operation manual; completion per deadline; punctuality;	Likert 1–5

Variable	Operational Definition	Dimensions	Indicators	Scale
	effectiveness and efficiency (Sihaloho, 2019).		teamwork and collaboration	

Source: Compiled by researchers, 2025

Population and Sample

The population consists of all 120 Response Team officers at the Cirebon Regency Fire Department. The sample size was determined using the Slovin formula with a 5% margin of error ($n = N / (1 + N \cdot e^2)$), yielding 93 respondents selected through proportionate stratified random sampling across three main fire stations.

Data Collection Techniques

Data were collected through a closed-ended questionnaire using a Likert 1–5 scale administered directly to 93 respondents. The questionnaire covers all three variables. Example items: X_1 — “I feel that the tasks assigned exceed my available capacity”; X_2 — “The work targets set are very high and difficult to achieve”; Y — “I am able to complete rescue tasks quickly and on time.”

Data Analysis Techniques

Data analysis was performed using IBM SPSS Statistics, including: (1) a validity test using Pearson correlation with the criterion $r\text{-count} \geq r\text{-table}$; (2) a reliability test using Cronbach's Alpha with the criterion $\alpha \geq 0.70$; (3) classical assumption tests (normality and multicollinearity); (4) multiple linear regression analysis; (5) partial hypothesis testing (t-test) and simultaneous hypothesis testing (F-test); and (6) the coefficient of determination (R^2).

4. Result And Discussion

Validity Test

Validity testing was conducted using Pearson correlation between item scores and total variable scores. With $n = 92$, $df = 90$, and a significance level of 0.05, the $r\text{-table}$ value is 0.205; an item is declared valid if $r\text{-count} \geq r\text{-table}$.

Table 2. Validity Test Results

Variable	r-count range (10 items)	r-table	Result
Work Stress (X_1)	0.537 – 0.842	0.205	All items valid
Workload (X_2)	0.398 – 0.798	0.205	All items valid
Employee Performance (Y)	0.596 – 0.880	0.205	All items valid

Source: IBM SPSS Statistics output

All items across the three variables are declared valid, as every $r\text{-count}$ value exceeds the $r\text{-table}$ value of 0.205, confirming that the instruments reliably measure the intended constructs.

Reliability Test

Table 3. Reliability Test Results

Variable	Cronbach's Alpha	N of Items	Criterion
Work Stress (X_1)	0.918	10	Reliable
Workload (X_2)	0.887	10	Reliable
Employee Performance (Y)	0.940	10	Reliable

Source: IBM SPSS Statistics output

All three variables produced Cronbach's Alpha values above the 0.70 threshold, confirming that the research instruments are reliable and produce consistent measurements.

Classical Assumption Tests

Table 4. Normality Test (One-Sample Kolmogorov–Smirnov)

N	Mean	Std. Deviation	Test Statistic	Asymp. Sig. (2-tailed)
92	0.0000000	7.38306103	0.082	0.163

Source: IBM SPSS Statistics output

The Asymp. Sig. (2-tailed) value of 0.163 is greater than 0.05, indicating that the residual data are normally distributed; data points scatter around the diagonal line in the P-P plot, confirming that the normality assumption is met.

Multiple Regression Analysis and Multicollinearity Test

Table 5. Multiple Linear Regression and Multicollinearity Test Results

Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	34.107	3.190	–	10.691	0.000	–	–
Work Stress (X_1)	–0.381	0.143	–0.467	–2.658	0.009	0.331	3.023
Workload (X_2)	0.476	0.161	0.519	2.954	0.004	0.331	3.023

Source: IBM SPSS Statistics output

VIF values for both independent variables (3.023) are well below 10, and Tolerance values (0.331) exceed 0.10, confirming that the regression model is free of multicollinearity. Based on Table 5, the resulting regression equation is:

$$Y = 34.107 - 0.381 X_1 + 0.476 X_2$$

The constant of 34.107 represents the baseline performance level when both independent variables are held at zero. The Work Stress coefficient (–0.381) indicates that each one-unit increase in work stress decreases employee performance by 0.381 units, holding workload constant. The Workload coefficient (0.476) indicates that each one-unit increase in workload increases employee performance by 0.476 units, holding work stress constant.

Hypothesis Testing

Partial test (t-test): the t-count for Work Stress is –2.658, exceeding the t-table value of –1.99 in absolute terms, with a significance value of $0.009 < 0.05$. H_0 is rejected, meaning Work

Stress has a significant negative effect on Employee Performance, so H1 is accepted. The t-count for Workload is 2.954, exceeding the t-table value of 1.99, with a significance value of $0.004 < 0.05$. H0 is rejected, meaning Workload has a significant positive effect on Employee Performance, so H2 is accepted.

Table 6. Simultaneous Test (ANOVA) Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	496.182	2	248.091	4.451	0.014
Residual	4960.373	89	55.735	–	–
Total	5456.554	91	–	–	–

Source: IBM SPSS Statistics output

The F-count of 4.451 exceeds the F-table value of 3.10, with a significance value of $0.014 < 0.05$. H0 is rejected, meaning Work Stress and Workload simultaneously have a significant effect on Employee Performance, so H3 is accepted.

Table 7. Coefficient of Determination (Model Summary)

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.302	0.091	0.071	7.466

Source: IBM SPSS Statistics output

The R² value of 0.091 indicates that Work Stress and Workload jointly explain 9.1% of the variation in Employee Performance, while the remaining 90.9% is influenced by other variables such as organizational culture, work environment, compensation, and leadership style.

Discussion

The negative and significant effect of work stress on employee performance is consistent with Mardiani and Khamdanah (2022), confirming that high stress levels — triggered by task demands, role conflicts, and traumatic field experiences — impair concentration and decision-making, which are critical competencies for firefighting officers. Officers constantly facing extreme physical hazards, witnessing casualties, and managing public expectations are especially vulnerable to stress-induced performance decline. This finding underscores the importance of implementing structured psychological support programs, peer counseling, and regular stress management training within the Fire Department.

The positive and significant effect of workload on performance reflects the motivational dimension of workload theory (Hart & Staveland, 1988) — moderate, challenging workloads can stimulate employee engagement and productivity. This aligns with Fariat Balqis (2020) and Mangowal et al. (2024), who found that workload within a manageable range enhances performance. However, this finding must be interpreted with caution: the Response Team's workload frequently exceeds physiological capacity due to staffing limitations, wide coverage

areas, and diverse emergency types. Sustained overload risks chronic fatigue and eventual burnout, ultimately reversing the positive performance effect.

The simultaneous significant influence of both variables confirms that an integrated management approach is essential. Organizations that address only stress or only workload in isolation will achieve suboptimal results. A comprehensive strategy — encompassing proportional workload distribution, psychological support, improved physical facilities at remote stations, and fair rotation scheduling — is required to sustainably improve Response Team performance.

5. Conclusion

Conclusion

Work stress has a significant negative effect on the performance of Response Team officers at Cirebon Regency Fire Department ($t = -2.658$, $\text{sig.} = 0.009$). The higher the work stress experienced by officers, the lower their performance. Workload has a significant positive effect on employee performance ($t = 2.954$, $\text{sig.} = 0.004$). Within a manageable range, workload can stimulate performance, though excessive workload risks burnout and performance deterioration. Work stress and workload simultaneously have a significant effect on employee performance ($F = 4.451$, $\text{sig.} = 0.014$), collectively explaining 9.1% of performance variation.

Suggestions

The Cirebon Regency Fire Department should implement structured psychological support programs and regular stress management training to reduce the negative impact of work stress on officer performance. Management should review and optimize workload distribution across stations, establish clear rest rotation schedules, and monitor individual workload levels to prevent chronic overload. Future research should include additional variables such as work environment, compensation, leadership style, and organizational culture to more comprehensively explain the factors driving Response Team performance.

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