

THE RELATIONSHIP BETWEEN JOB STRESS AND EMPLOYEE PERFORMANCE IN MANUFACTURING INDUSTRY IN INDONESIA

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ABSTRACT

One-fourth of Indonesia's Gross Domestic Product or GDP is from the manufacturing industry sector. Indonesia's government has proactively encouraged companies to increase their production capacity to meet the global demands, leading to strong demand for employees to work harder, affecting the workers' health. Overwork is often associated with fatigue, stress, and various health problems. Moreover, stress due to excessive work is a general problem many industries face and frequently influences workers' performance. Therefore, this research intends to examine the relationship between work stress and workers' performance, particularly in the manufacturing industry in Indonesia. The sample data are collected from ninety-three workers at the staff level across various companies in the manufacturing sector. The relationships between the determining factors and the Employee Productivity are evaluated by using the multivariate regression analysis. At the correlation coefficient of 0.972, we found a statistically strong relationship between the work environment and Stress to the workers' performance. The condition of low performance is attributed to the non-standard working hours and low quality of the relationship between colleagues and their superiors. Finally, the research recommends improved management of workers' stress by companies involving the adoption of flexible working hours and better communication between parties via discussion forums and meetings. Therefore, employees will be more motivated to improve work productivity.

Keywords: *Employee Performance, Manufacturing Industry, Work Environment, Work Stress*

1. INTRODUCTION

Workers of any corporation need financial incentives, safety, and protection in mental and physical health. Physical and emotional illness may lead to worker's Stress, affecting their productivity and quality of life. In general, work stress can be categorized into two groups, namely, Eustress and Distress. Eustress is beneficial for health, providing motivation leading to positive impacts on workers and the organization. Meanwhile, distress is non-beneficial or negatively impacts, draining energy and leading to fatal consequences to workers and the organization.

Work stress is a condition that arises from the interaction between humans and

work and is characterized by human changes that force them to deviate from their everyday functions (Robbins & Coulter, 2007). Work-related factors, according to (Materson Materson, 1980), work stress is influenced by large workloads and responsibilities, changes in the work system, lack of supervision, inadequate training, unsupportive work environment, and poor relationship with co-workers. Another factor that contributes to creating work stress, according to (Shimazu and Kosugi, 2003) is the number of long working hours with short rest periods and many work demands. Likewise, on the health side, (Selye, 2013) shows how stress is a risk factor for various health problems and diseases, which he labeled maladaptation. The health-related issues contribute to lower company performance and high staff turnover, and absences due to mental health problems such as anxiety, depression, other emotional disorders, and minor physical illnesses such as headaches, heart disease, stomach problems, and obesity (MacKay, et al., 2004).

Based on the above theories, work stress can harm team member performance in various work sectors. In the industrial sector, work pressure from superiors affects workers to become frustrated, which results in high turnover in the company (Bamba, 2016). Then in the banking sector, Stress causes workers' performance to decline and affects rewards (Ahmed & Ramzan, 2013). Likewise, in the medical industry sector, several studies have been done (Al Rasasi, et al., 2018) examined work-related Stress among nurses in Dubai (AlMazrouei & Pech, 2015) also examined the determinants of Stress among doctors in Dubai. Both research studies concluded that doctors and nurses experience high levels of stress-related due to workloads. (Khan & Khurshid, 2017) also stated that increasing pressure at work would reduce employee welfare.

Currently, the manufacturing industry in Indonesia is the backbone of national economic growth. Based on data released by the United Nations Statistics Division in 2016, Indonesia is ranked fourth in the world out of 15 countries whose manufacturing industries contribute more than 10 percent to Gross Domestic Product (GDP). With the rapid development of the industry, market demand is increasing, an opportunity for manufacturing industry players. The success rate of industrial development is determined by the quality of its human resources, in this case, the employees working in this field.

Several factors determine the assessment of employee performance in the manufacturing industry. Factors that are following the manufacturing industry are factors from Mathis and Jackson theory, namely: Quality of results (level of customer satisfaction), ability to work together (time of the process of changing production activities/changeover time), several results (capacity utilization), timeliness of results (production and achievement schedules), attendance (absentee level) (Mathis & Jackson, 2006).

The demand for production targets to maintain customer satisfaction creates an increased workload at a particular time, causing work stress on employees to meet the quality and quantity of production. According to (Hart & Staveland 1988), Indicators of workload are factors of task/job demands, effort/labor, and performance. Continuous work pressure can lead to decreased employee productivity as result of physical and mental fatigue. Low productivity levels have an impact on not achieving production targets.

These various work stress problems prompted researchers to make a further study about job stress and performance. The primary purpose of this study is to examine the correlation between work stress factors and employee performance and how work stress affects employee performance; to identify what work stress factors significantly contribute to decreasing performance among manufacturing employees; to develop a solution for the problems that occur in the organization concerning work stress that affects job performance. Based on the arguments from previous research, the problem formulation will be analyzed in this study, such as: What work stress factor is the most significant in affecting employee performance/productivity? How does job stress affect employee performance? How is the innovation for stress management on workers? What is the right solution to increase employee performance productivity through stress management?

2. METHODOLOGY

In this research, we focus on workers in large-size companies in the business areas: textile and garment manufacturing industry, electronics, food and beverage, building materials, and automotive. In total, we collect data from 93 respondents. We

analyze the relationships between Work Stress, Work Environment, and Employee Performance. The first variable, namely, Work Stress, has the following dimensions: excessive workload; the workhour factors include these indicators: long working hours, lack of time to complete the task, and short break; environmental factors and work facilities consist of these indicators: unsupportive work support tools and situation; wages and rewards factors consist of these indicators: lack of rewards for job appreciation; the relationship with colleagues and superiors includes these indicators: poor communication and coordination with co-workers.

Theoretically, Work Stress has an impact on the performance appraisal. The indicators for the assessment are Ability factors consisting of accuracy in completing work; precision and seriousness at work; timeliness of results, understanding of work instructions, cooperation and knowledge; and attendance. Based on this explanation, a hypothesis can be formulated that job stress significantly affects employee performance in the manufacturing industry. The relationships among the three variables and the dimensions of each variable are graphically presented in Figure 1 and Table 1.

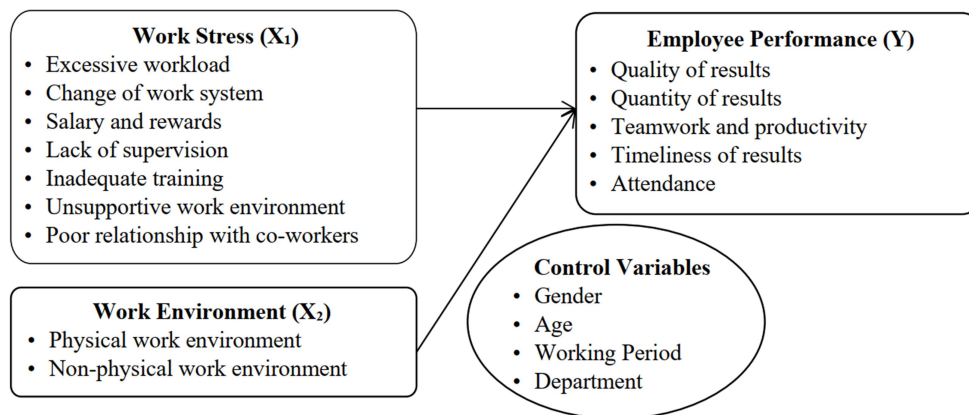


Figure 1. The relationships between Work Stress, Work Environment, and Employee Performance.

Variable	Dimension	Scale
Work Stress [2]	Excessive workload	Ordinal
	Change of work system	
	Salary and rewards	
	Lack of supervision	
	Inadequate training	
	Unsupportive work environment	

	Poor relationship with co-workers	
Work Stress [3]	Total working hours	Ordinal
	Work demands	
Work Environment [13]	Physical work environment	Ordinal
	Non-physical work environment	
Employee Performance [11]	Quality of results	Ordinal
	Quantity of results	
	Teamwork and productivity	
	Timeliness of results	
	Attendance	

Table 1. The research variables, references, indicators, and the scale of measurements.

The hypotheses to be tested are as follows:

H1: Work Stress affects Employee Performance.

H2: Work Environment affects Employee Performance.

H3: Work Stress and its interactions with the Work Environment affect Employee Performance.

The operational definitions of the variables are explained in Table 1.

In this study, data collection is carried out by researchers by distributing questionnaires. The targeted employees are given a list of statements to fill in, which would then be used as data sources in the study. The researcher gave several questions, and this research also includes a literature study as a theoretical basis. Data will be collected through direct distribution of online questionnaires using a Likert scale to measure respondents' perceptions.

Measure scale (1) totally disagree, until score (5) strongly agree. This study discusses about work stress and its effect on employee performance. The target respondents of this study are staff-level employees in the production division, QA / QC, general affairs, personnel, finance, and sales and marketing. The data obtained are evaluated in terms of validity, reliability, correlation, and regression. The validity test is conducted to measure the instrument's ability to measure the concepts of concern. This test uses Pearson's correlation statistic, which is calculated by Equation (1).

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{(n-1)s_x s_y} \quad (1)$$

where x_1 and \bar{x} is a score and the average of variable x . The symbol s_x is the standard deviation of variable x , and n is the number of samples. The level of statistical

significance r can be measured by the t - statistic obtained by Equation (2).

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \quad (2)$$

The data is evaluated in terms of reliability which measures the consistency of the indicators' answers to an instrument. Reliability was evaluated using Cronbach's Alpha. The data are also evaluated in terms of the suitability of the data distribution to the normal distribution. This evaluation uses the Kolmogorov-Smirnov test. The association between each independent variable and the dependent variable was evaluated using Pearson Correlation Coefficient. This coefficient value that is greater than 0.60 indicates a strong relationship and becomes the basis for conducting multi-variable regression analysis. Finally, the relationship between job stress variables, work environment variables, and employee performance variables is evaluated by the linear model (3):

$$y = \beta_0 + \beta_1 \cdot x_1 + \beta_2 \cdot x_2 \quad (3)$$

where x_1 represents Work Stress, x_2 represents Work Environment, and y represents Employee Performance.

3. RESULT and Discussion

Firstly, we discuss the demographics data of the respondents (see Table 2). The majority of the respondents, in the order of 58% of the total respondents of 93, are from the garment and textile industry. Seventy-five percent are with the productive age of 21 and 30 years old. Nearly sixty percent have been with their respective employers for a duration of one and five years, mainly in the Sales and Marketing division (41%).

	Classes	n	%
Age (year)	21-30	70	75
	31-40	16	17
	41-50	4	4
	51-60	3	3
Gender	Male	52	56
	Female	41	44
Experience	< 1 year	24	26
	1-5 year	56	60
	6-10 year	8	9

	> 10 year	5	5
Sub-sector industry	Building material	22	24
	Electronic	5	5
	Textile & Garment	54	58
	Food & Beverage	11	12
	Automotive	1	1
Department	Accounting	8	9
	Human resource	4	4
	Production	21	23
	QA/QC	11	12
	Sales & Marketing	38	41
	General Affair	11	12

Table 2. Respondent's Profile.

Variable	Indicator	Question	CITC*(r)	Remarks
Work Stress (Cronbach's Alpha = 0.636)	WS01	I have a big responsibility in my job.	0.645	Valid
	WS02	My job requires high concentration.	0.390	Valid
	WS03	My job has a high risk.	0.405	Valid
	WS04	The task given is not suitable with my ability.	0.630	Valid
	WS05	I have very limited time to rest.	0.616	Valid
	WS06	Irregular working hours and or overtime	0.584	Valid
	WS07	I'm able to perform my job better if I'm given more time.	0.621	Valid
Work Environment (Cronbach's Alpha = 0.693)	WE08	The condition of the work support tools that are not good makes me frustrated.	0.558	Valid
	WE09	Intolerable noise level in my workspace bothers me.	0.502	Valid
	WE10	The situation in the work environment makes me feel physically and psychologically insecure.	0.661	Valid
	WE11	The supervisors are subjective in evaluating employees.	0.699	Valid
	WE12	Supervisors rarely provide rewards for well-performing employees.	0.592	Valid
	WE13	I have a poor cooperation and communication with co-workers.	0.748	Valid
Employee Performance (Cronbach's Alpha = 0.697)	JP14	I am always able to finish my job consistent with the predetermined quality standard.	0.565	Valid
	JP15	I am always able to do better on my job to get maximal results.	0.493	Valid
	JP16	I am always able to finish my job on time.	0.616	Valid
	JP17	I am always able to come in to work except for very important reasons or illness.	0.678	Valid
	JP18	I am always able to come in to work on time.	0.604	Valid
	JP19	I will help my co-workers who have difficulty on completing their work.	0.690	Valid
	JP20	I try to increase my productivity.	0.532	Valid

Table 3. Results of Validity and Reliability Tests of the Research Instruments.

The data are collected by using questionnaires. Previously, the instrument is assessed for its validity and reliability. The Pearson's correlation coefficient assesses the former aspect, and the latter aspect is by the Cronbach's alpha statistic. The results of the validity and reliability tests are presented in Table 3. Data distribution for three variables was evaluated in terms of normality. For this Kolmogorov-Smirnov statistics are used. The results of the calculations in Table 4 show that the data is normally distributed with a p-value > 0.05.

Variable	Kolmogorov-Smirnov Test		
	Statistic	df	p-
Work Stress	0.079	93	0.196
Work	0.075	93	0.200
Job Performance	0.076	93	0.200

Table 3. The results of the normality tests.

The opinions of the respondents about the Work Stress, Work Environment, and Job Performance are summarized in Table 5. Generally speaking, the respondents consider short-resting hour and the irregularity in the working-hour to be the determining factors of Work Stress. On the average, their opinions about the first aspect is at the scale of 2.77, and as for the latter, the average is 2.65. This finding is supported by Ref. (Caruso, et al., 2006), which shows that the effects of long and non-standard working hours on various health outcomes, including acute reactions such as Stress, fatigue, poor health, and mental illness.

As for the second independent variable, namely, the Work Environment, the opinions of the respondents are also depicted in Table 5. In regards of the work situation as a dimension of the variable Work Environment, the respondents' opinion is at the scale of 2.43. Meanwhile, for the poor relationship dimension, the average scale is 2.52.

Variable, Dimension, Indicator	Respondent's Opinion													
	1	2	3	4	5	M	S							
Work Stress														
Workload and responsibility														
		Big job responsibilities						25	30	16	15	7	2.45	1.26
		Work requires high concentration						20	39	13	17	4	2.42	1.46
		High risk job						19	39	18	13	4	2.40	1.10
		The given task is not suitable with ability						30	28	16	12	7	2.33	1.26
Working hours														

	Short break time	17	29	18	16	13	2.77	1.32
	Irregular working hour	21	27	21	12	12	2.65	1.32
	Job done better if given a longer time	27	30	15	14	7	2.40	1.26
Work Environment								
Physical work environment								
	Condition of work support tools are inadequate	26	32	16	13	6	2.37	1.21
	High noise level	26	35	12	16	4	2.32	1.18
	The work situation is uncomfortable	18	44	14	7	10	2.43	1.20
Non-physical work environment								
	Subjective performance evaluation	24	34	17	11	7	2.39	1.21
	Lack of appreciation from superiors	22	41	17	9	4	2.27	1.07
	Poor relationship with coworkers	22	31	19	12	9	2.52	1.26
Job Performance								
Meet the standard								
	Meet the task according to standards	26	32	16	13	6	2.37	1.21
	Complete tasks optimally	26	35	12	16	4	2.32	1.18
Punctuality								
	Timeliness in completing tasks	18	44	14	7	10	2.43	1.20
	Attendance	24	36	15	11	7	2.39	1.21
	Timeliness at work time	22	41	17	9	4	2.27	1.07
Cooperation and productivity								
	Support for coworkers	22	31	19	12	9	2.52	1.26
	Increased productivity	25	30	14	14	10	2.51	1.32

Table 4. Opinions regarding Work Stress, Work Environment, and Job Performance

Many previous studies suggest that the physical and non-physical Work Environment play as an important role in work performance, job satisfaction, social relations, and physical and mental health. Thus, we conclude that based on the average dimension value, physical and non-physical work environments have a dominant influence. The opinions of the respondents regarding the Job Performance are also presented in Table 5. In the variable, the Cooperation and Productivity dimension contains two indicators, namely, Support for Co-workers and Increased Productivity. On the average, their opinions are at the scale of 2.52 for the Support for Co-workers and 2.51 for the Increased Productivity.

The finding is supported by Ref. (Mangkunegara, 2016), which suggests that performance appraisal is the result of the quantity and quality achieved by an individual in carrying out his duties in accordance with the given responsibility. On the following, we shift the discussion to the analysis of multivariate regression. We begin with the coefficient of determination R^2 . Physically, the statistic denotes the ratio of the

variation predicted by the theory and the data variation.

The current model and data have an agreement at $R^2 = 0.946$, suggesting that the variables Work Stress and Work Environment are excellent predictors for Employee Performance. Furthermore, we assess the statistical significance of the relationships between Work Stress and Work Environment to Employee Performance. The relationships are assessed via the Analysis of Variance (ANOVA), and the results are presented in Table 6. With the value of F-statistic of 783.232, associated with the p-value = 0.000, the relationships of the two independent variables to the dependent variable are supported by the data.

Model	Sum of Squares	df	Mean Square	F	Sig	F table	
1	Regression	2209.983	2	1104.991	782.232	.000	3.100
	Residual	127.135	90	1.413			
	Total	2337.118	92				

Table 5. Results of the multivariate regression ANOVA test

In a more detail level, the relationships of each independent variable to the dependent variable is evaluated by means of the t-test. The results are presented in in Table 7. For the relation of Work Stress and Employee Performance, the t-value is 3.696, an extremely high value, suggesting a strong dependence between the two variables. For the relation of Work Environment and Employee Performance, the t-value is 26.510, which is also very strong.

Model	Unstandardized B	Coefficients Std. Error	Standardized Coefficient Beta	t	Sig	
1	(Constant)	.339	.479	.708	.481	
	Work Stress	.128	.035	.123	3.696	.000
	Work Environment	.996	.038	.885	26.510	.000

Table 6. Result of multivariate regression test between Work Stress, Work Environment and Employee Performance – coefficients

The table also shows that the three variables are related with the formula:

$$\text{Employee Performance} = 0.339 + 0.128 \text{ Work Stress} + 0.996 \text{ Work Environment}$$

The current findings are in agreement with the finding of (Shimazu & Kosugi 2003). Apart from working hours, they find Stress is also influenced by work demands. Regarding working hours, (Osterman, 1995) sees organizations with high productivity often found with flexible work policies and career breaks. This policy gives employees

more room to resolve work demands with family goals.

Employees have time to develop themselves and complete the work thoroughly. Employees feel satisfied, which has a positive implication on productivity. In addition to working hours, the environmental situation is also a factor influencing employee performance. Performance is the result of employee motivation and ability, and how they adapt to situational constraints and uncomfortable environments.

This cannot be ignored because it leads to behavioral disorders; specifically referred to low performance (Al-Omari & Okasheh, 2017). A conducive work environment is one of the factors that increases employee productivity. A workspace that has good acoustics can reduce the noise level that comes from the outside. Also, the workspace layout, according to human spatial standards, co-workers support, appreciation from superiors, affect the mental health of an individual positively.

4. CONCLUSION

The main finding of the research is the existence of the statistically significant relationship between Work Stress and Work Environment to Employee Performance for companies in manufacturing sector in Indonesia. The research also identifies that the non-standard and long working hour contributes greatly to Work Stress. The condition of tight deadlines also leads to unsatisfactory working condition. These results suggest companies to review the employee's working hour to a duration that improves workers' productivity.

In addition to the Work Stress, the study also finds Work Environment as a contributing factor to Employee Performance in the manufacturing industry. The finding implies that for companies to gain additional productivity, Work Environment is crucial for improvement. Certainly, a better Work Environment advance companies towards their vision and mission. Within the variable Work Environment, the current findings suggest that the poor relationships between co-workers and their superiors to be detrimental.

Companies should strongly consider improving inter-personal relationships by any means such as with an additional social forum. Thus, the results of this study only provide an overview of the relationships between variables when the study is conducted.

As mentioned earlier, there are two types of Stress which affects differently to an individual. It is suggested for further research to measure the stress level that can increase work productivity. In addition, this study is conducted on employees at the staff level, where each level of work had a different impact on the level of Stress experienced, which would certainly affect employee performance.

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