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STRESS FACTORS OF LABOR CONSTRUCTION OF BUILDING CONSTRUCTION ON PERFORMANCE TIME AND COST

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Abstract

Human resources are an important factor in the implementation of construction projects. This is because the role of human resources is very dominant where HR is the main driving force in construction project work, so the quality of human resources is a determining factor for the success of a project. The purpose of this study is to make a regression model equation that can be used to predict the stress factor of construction workers (consultants and contractors) of buildings on time and cost performance. This research method uses a survey, namely by distributing questionnaires to collect main data to obtain facts by taking samples from the population. The results showed that the stress factors for building construction workers (contractors) that affect time performance were that I was not confident with my work because I did not complete the task properly (X18) and there were no definite regulations from the company regarding the workforce career development process. work (X22).

Keywords: *Stress Factors, Labor, Building Construction*

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INTRODUCTION

In an effort to achieve good construction results, of course, various resources are needed. These resources include material, equipment, capital and human resources. Human resources are an important factor in the implementation of construction projects. This is because the role of human resources is very dominant where HR is the main driving force in construction project work. Luthfan Atmaji also mentions that HR is the main motor of the organization in carrying out all its activities in an effort to achieve goals (Atmaji & Rahardjo, 2011). This opinion is supported by Simamora in (Hidayati et al., 2011) that HR is a central factor in organizations. human performance is a critical factor in determining organizational performance (Jost et al., 2007). So the quality of human resources is a determining factor for the success of a project, by having good quality human resources, the company's productivity will be higher (Rachman et al., 2011) Thus, serious attention to HR management is one of the critical success factors for construction projects that is absolutely necessary.

The quality of workers can be assessed from a technical and mental point of view. The good and bad mentality of workers is influenced by the ability to deal with various work pressures. Sources of work pressure can come from within or from outside the workers themselves. The pressure that comes from outside that can be seen today is the development of construction work which is becoming more complex and more sophisticated, demanding adjustments to all workers involved in the world of construction, such as in terms of mastery of

technology, work methods and newly discovered materials. In addition, several other sources of pressure such as changes to stricter regulations, demands for increased work output, as well as demands to complete construction work faster.

According to Wahab, 2010; Loosemore and Waters, 2004, stressed workers will experience a decrease in quality and quantity in the work environment as well as a decrease in work accuracy. Indications of the declining quality and quantity of workers include: increased absenteeism, low employee morale, increased turnover, and high staff turnover. All the problems of decreasing quality and quantity will cause a decrease in productivity.

Clarke and Cooper (2014) added that stress can be a trigger for work accidents. Sutanto (2010) agrees with Clarke and Cooper that personal circumstances, management, environment, and equipment are factors that can cause work accidents. Work accidents occur because stress makes workers unable to concentrate properly. Loss of concentration at work can increase the risk of accidents such as falling, falling, or tripping, etc.

Stress that occurs in the workforce can be caused by several sources of stress. Potential sources of stress that trigger work stress usually come from within the family or personal life, interpersonal relationships, or due to workload. (Semple et al., 2011) identified three categories of potential stressors, namely: environmental, organizational, and personal. Environmental uncertainty affects the level of stress on the workforce in an organization. The environmental uncertainty is related to changes in the business cycle, uncertainties in the country's economy, and changes in technology. While organizational factors that can trigger stress include: task demands, role demands, and interpersonal demands. And in terms of personal factors that can cause stress are family problems, and personal economic problems.

Meanwhile, sources of stress according to (Offia Ibem et al., 2011) in their journal about "work stress among professionals in the building construction industry in Nigeria", which can cause job stress in construction workers in Nigeria are "organizational function and culture, interpersonal relationship at work, career development and job status, preparation and training, job content, workload and work place, work time, role in organization". Apart from Nigeria, there is also a study that Campbell conducted in 2006 on construction project managers in the UK. There are several factors that cause work stress, including: "physical factors, organizational factors, job demand factors, and job role factors" (Vasconcelos et al., 2006). Research on work stress was also conducted in Hong Kong in 2007 by Leung et al on estimators, Leung et al identified sources of work stress, among others: "personal behavior, social support, role conflict, poor environment, work underload, home-work conflict" (Lee et al., 2007). Furthermore, research in Malaysia by (Japar, 2014) on quantity surveyors, namely the number of jobs and deadlines. There is a need for research to be carried out in the construction industry because according to (Offia Ibem et al., 2011), it is stated that construction work is the third most stressful profession after mining and the police. While in Indonesia itself, especially in Jakarta, research on the factors that cause work stress in the construction industry is very limited, especially those that discuss the factors that cause work stress in contractors and consultants in Jakarta.

The purpose of this study is to make a regression model equation that can be used to predict the stress factor of construction workers (consultants and contractors) of buildings on time and cost performance. The benefits of the research to be conducted on the factors that cause work stress for building construction workers to contractors and consultants in Jabodetabek, the first is expected to contribute to the development of knowledge in the field of project management and human resource management, especially on the factors that cause work stress for contractor workers. and consultants on building construction projects in Jabodetabek

METHOD

This research can be classified as an exploratory research that aims to determine the factors that influence work stress on contractors and consultants in Jakarta. This research method uses a survey, namely by distributing questionnaires to collect main data to obtain facts by taking samples from the population.

Where the main purpose of this exploratory research is to identify the research situation and data needed for further research. If the research problem is still not clear, it is more suitable if a qualitative method is used which means that it goes directly to the object so that the problem can be found clearly (Sugiyono, 2013).

Based on the studies conducted on previous research, it is known that there has never been a study on the factors causing work stress estimators in Jakarta, so that this research can be classified as an exploratory research. The assessment variables in this study were obtained from several previous studies.

RESULT AND DISCUSSION

1. Respondent Description

Analysis Description of respondents in this study was used to find out information within the respondent including age, gender, education, etc. which was presented in a frequency distribution. The requirement for sampling is a minimum of 30 respondents based on the central limit theory from David and Suton in (Wulandari & Mutmainah, 2011), so that the number of samples has met the specified criteria. The results of the analysis of the characteristics of the respondents can be explained as below:

Table 1. Results Description of Respondents Characteristics by Education

Category	Frequency	Percentage (%)
SMK/SMA	6	15.8
D3	2	5.3
S1	29	76.3

Masters	1	2.6

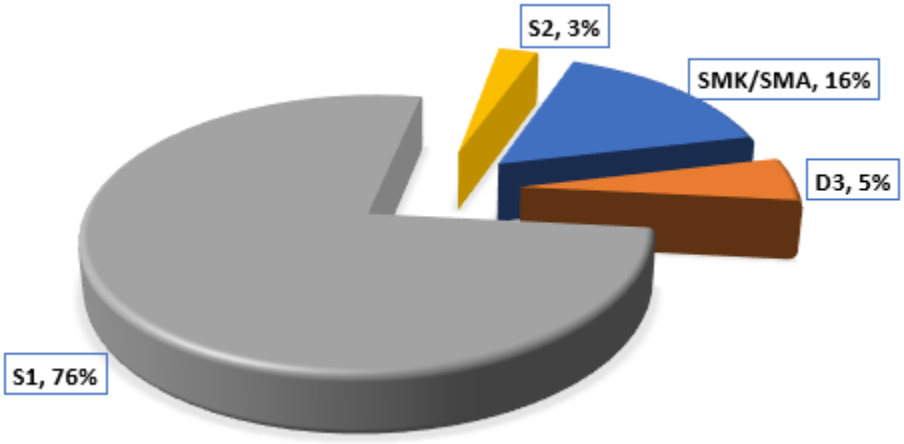

Figure 1. Pie Graph of Respondents Characteristics by Education

Based on the results of the analysis in table 4.1, it can be seen that most of the respondents in this study had the last bachelor's degree in education, and at least the respondents had the last bachelor's degree. This is because to enter the career path into contractors and consultants at least S1, while the education level is SMA/SMK due to having worked for a long time / already have experience.

Table 2. Results Description of Respondents' Characteristics by Gender

Category	Frequency	Percentage (%)
Male	34	89.5
Female	4	10.5

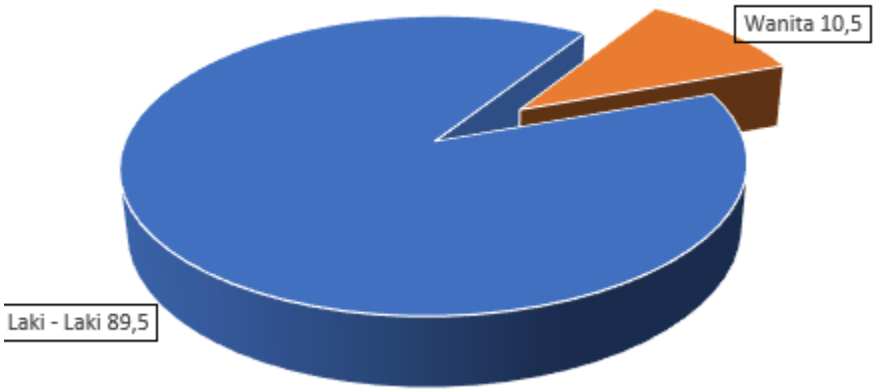

Figure 2. Pie Graph of Respondents Characteristics by Gender

Based on the results of the analysis in table 2, it can be seen that most of the respondents in this study were male by 89.5%, and the remaining 10.5% of respondents in this study were female. . This is because the physically demanding work in the field is male.

Table 3. Results Description of Respondents Characteristics by Occupation

Category	Frequency	Percentage (%)
Consultants	13	34.2
Contractors	25	65.8

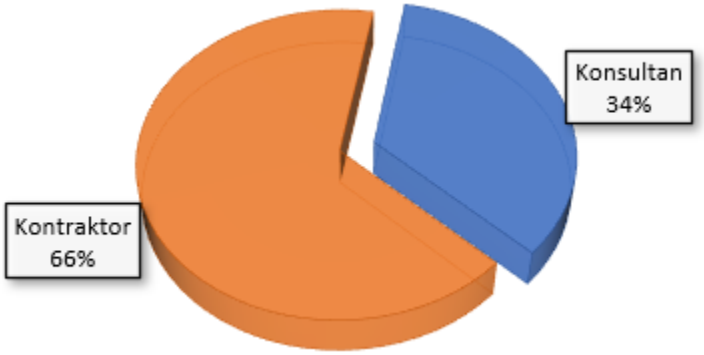

Figure 3. Pie Graph of Respondents' Characteristics by Occupation

Based on the results of the analysis in table 3, it can be seen that most of the respondents in this study worked as contractors, namely 65.8%, and the remaining 34.2% of respondents worked as consultants. This is because there are more contractor companies than consultants.

Table 4. Results Description of Respondents Characteristics by Position

Category	Frequency	Percentage (%)
Project Manager	**5**	**13.2**
Quality Assurance	**1**	**2.6**
Quality Control	**2**	**5.3**
Quantity Surveyor	**6**	**15.8**
Staff Engineer/Drafter	**2**	**5.3**

Staff Engineer/ Engineering	**11**	**28.9**
Supervisor	**11**	**28.9**

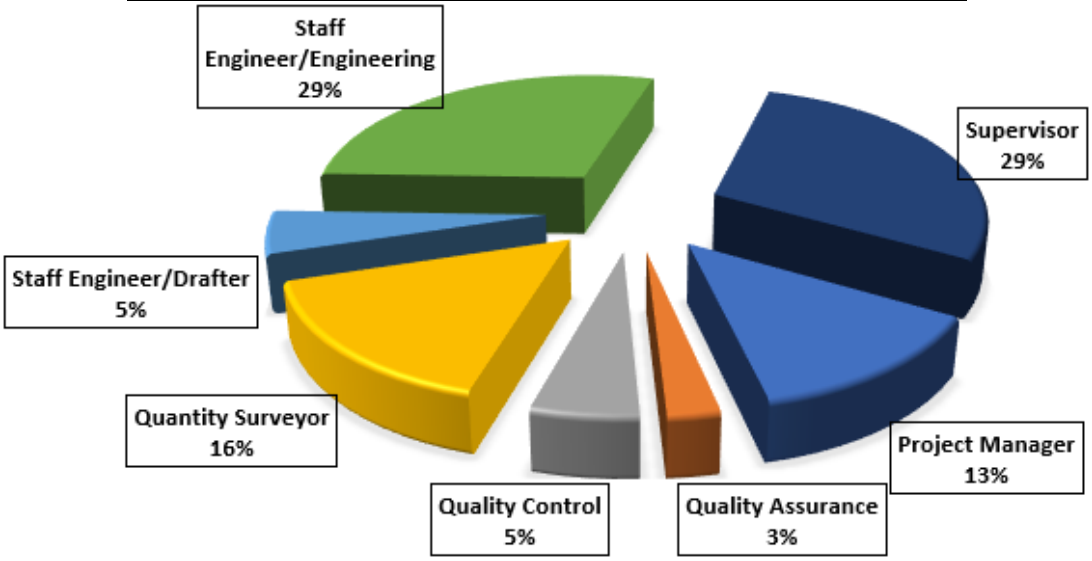

Figure 4. Pie Graph of Respondents' Characteristics by Position

Based on the results of the analysis in table 4, it can be seen that most of the respondents in this study served as Supervisors and Engineer/Engineering Staff. While at least the respondents served as Quality Assurance, Quality Control. This is because the positions as Supervisor and Staff Engineer/Engineering are common positions in contractor and consulting companies.

Table 5. Results of Characteristics of Respondents Based on Age

N	Minimum	Maximum	Mean	Std. Deviation
38	23.00	61.00	35.6842	10.66975

Based on the results of the analysis in table 5, it can be seen that the average age of the respondents is 35.6842 years with the youngest age being 23 years and the oldest 61 years. The standard deviation value is 10.66975 years. This value is less than the average, indicating that the age diversity of the respondents in this study tends to be homogeneous.

Table 6. Results Description of Respondents' Characteristics Based on Experience

N	Minimum	Maximum	Mean	Std. Deviation
38	1.00	23.00	9.0263	5.11218

Based on the results of the analysis in table 6, it can be seen that the average respondent has 9,0263 years of work experience with the lowest experience being 1 year and the longest being 23 years. The standard deviation value is 5.11218 years. This value is less than the average, indicating that the diversity of respondents' work experience in this study tends to be homogeneous.

2. Project Job Description

Project Job Descriptions in this study are used to find out information on project work that has been done by respondents. The results of the analysis of Project Job Descriptions can be explained as follows:

Table 7. Results of Descriptive Analysis of Project Work

Description	Category	Frequency	Percentage (%)
Type of	Building Project 1 Floor	3	7,7
	Building	36	92,3
Functions of	Apartment	15	38,5
	Apartments & Hotels	2	5.1
	Lecture Buildings	1	2.6
	Logistics Warehouses	1	2.6
	Hotels	1	2.6
	Offices	5	12.8
	Houses	3	7.7
	Hospitals	3	7.7
	Flats	8	20.5
Types of	Overall Construction of the Building	32	82.1
	Mechanical Electrical & Plumbing	1	2.6
	Wooden Doors	1	2.6
	Renovation	1	2.6

	Sub & Upper Structure	2	5.1
	Upper Structure	2	5.1
Procurement	Tenders	29	74.4
	Direct Selection	6	15.4
	Appointment Direct	2	5.1
	Self	2	5.1
Contract System	Design and Build	1	2.6
	Combined Lumpsump and Unit Price	1	2.6
	Lumpsump	30	76.9
	Unit Price	7	17.9

Based on the results of the analysis in table 7 it can be it is known that most of the types of projects carried out by respondents are high-rise buildings, the function of the building as apartments, types of is the construction of the entire building, procurement through an auction, with a lumpsump contract system.

3. Description of Research Variables

Job Description Projects in this study were used to determine the description of the variables studied. The results of the analysis of the Description of Research Variables are described below:

1. Description of Research Variables

Table 8. Results of Descriptive Analysis of Time Performance Variables

N	Minimum	Maximum	Mean	Std. Deviation
38	49.32	120.00	96.4542	18.71074

Based on the results of the analysis in table 8. it can be seen that the average value of the Time Performance Variable is 96.4542 percent with the lowest value being 49.32 percent and the highest being 120 percent. The standard deviation value is 18.71074 percent. This value is less

than the average, indicating that the diversity of Time Performance between respondents in this study tends to be homogeneous.

Table 9. Results Category Variable Time Performance

Category	Frequency	Percentage (%)
Very late	2	5.1
Very late	2	5.1
Late	3	7.7
Slightly late	21	53.8
Faster	10	25.6

Based on the results of the analysis in table 9 it can be seen that most of the respondents have time performance in the Slightly late category, which is 53.8%. Then 25.6% of respondents have time performance in the Faster category. As many as 7.7 percent of respondents have time performance in the Late category. And the remaining 5.1% of respondents each have time performance in the category of Very late and Very late.

2. Cost Performance Variables

Table 10. Results of Descriptive Analysis of Cost Performance Variables

N	Minimum	Maximum	Mean	Std. Deviation
38	70.83	128.66	102.8171	16.13677

Based on the results of the analysis in table 10, it can be seen that the average value of the Cost Performance Variable is 102.8171 percent with the lowest value of 70.83 percent and the highest being 128.66 percent. The standard deviation value is 16.13677 percent. This value is less than the average, indicating that the diversity of Cost Performance among respondents in this study tends to be homogeneous.

Table 11. Results Category Variable Cost Performance

Category	Frequency	Percentage (%)
Very detrimental	8	20.5
Very detrimental	1	2.6

Adverse	4	10.3
detrimental	3	7.7
Not affected	22	56.4

Based on the results of the analysis in table 11, it can be seen that most of the respondents have cost performance in the Unaffected category, which is 56.4%. However, 20.5% of respondents have a cost performance in the category of very disadvantageous. As much as 10.3 percent of respondents have a cost performance in the category of very disadvantaged. And the remaining 7.7% of respondents have a cost performance in the category of Disadvantage and 2.6% of respondents have a cost performance in the category of Very detrimental.

1. Stress Factor

The stress factor value is obtained from the respondent's perception or response to the questionnaire/questionnaire given. The assessment category is determined based on the number of measurement scales used, which are five classifications.

where :

P = length of each class interval

X_{max} = maximum value

X_{min} = minimum value

b = many classes

Based on the results of the calculation of the class length for each interval, Table 4.5 presents the classification of assessment categories against the arithmetic mean value

Table 12. Classification of Assessment Categories for Descriptive Statistics

Average Score Calculate	Rating Category
1 – 1.80	Not Influential
1.81 – 2.60	Slightly Influential
2.61 – 3.40	Moderately Influential
3.41 – 4.20	Influential
4 ,21 – 5.00	Very Influential

Source: Data Processing Results

Based on Table 12, the scale can be used as a reference for assessing the results of the existing questions, which are related to the existing variables and discussed in this study.

1. Factor Analysis

Factor analysis was conducted to form groups of independent variables that were considered valid in explaining the main characteristics of the factors influencing design changes during the ongoing construction period. To simplify the independent variable which has r > 0.339 to the time performance and cost performance of construction projects. In the previous intercorrelation analysis on the independent variables, there was an intercorrelation so that before forming a linear regression equation from the independent variables, it was necessary to group them using factor analysis. Factor analysis is assisted by the SPSS 24.0 program by *clicking analyze > Dimension Reduction > Factor, inputting the variables included in the correlation test, then clicking descriptive and selecting KMO and Bartlett's test > continue, then clicking rotation and selecting variamax > continue > Ok.*

Table 13. The results of the combined factor analysis of consultants - contractors on time performance

Factors	variables	Description of independent variables	Coefficients	Description of substitute variables
1	X17	There is competition between workers.	0.840	Effect of competition/not cooperating, not confident and career path.
	X18	I am not confident with the results of my work because I do not complete the task well.	0.885	
	X22	There is no definite regulation from the company regarding the career development process of the workforce.	0.854	

(Source: SPSS Processing Results, 2022)

Table 15. Results of contractor factor analysis on time performance

Factors	Independent Variables	Description of independent variables	Coefficients	Description of substitute variables

1	X18	I am not confident with the results of my work because I do not complete the task well.	0.900	Not confident and career path
	X22	There is no definite regulation from the company regarding the career development process of the workforce.	0.900	

(Source: SPSS Processing Results, 2022)

CONCLUSION

The stress factors for construction workers (consultants) in buildings that affect cost performance are the assignment of tasks that are carried out very close to the deadline for work (X6), the break time during work is very short (X8), often working overtime without any prior notification (X9), The number of workers and limited resources result in heavier work demands (X10), Frequently checking the results in detail of the work of other workers or subordinates due to distrust (X15), There is no separation of workplaces between workers, one of the the impact is noisy and can interfere with privacy (X19), I often have difficulty deciding between high productivity and high quality (X20), There are no definite regulations from the company regarding the workforce's career development process (X22), Workers do not get the opportunity to get training /training (eg use of BIM technology) (X25), No feedback from a the boss given for the work that has been done by the Workforce (X26).

REFERENCE

Atmaji, L., & Rahardjo, M. (2011). *Pengaruh Stres Kerja dan Kepuasan Kerja terhadap Kinerja Perawat Studi pada Rumah Sakit Islam Sultan Agung Semarang*. Universitas Diponegoro.

Hidayati, R., Purwanto, Y., & Yuwono, S. (2011). Kecerdasan emosi, stres kerja dan kinerja

karyawan. *Jurnal Psikologi*, *2*(1).

Japar, M. (2014). Religiousity, Spirituality and Adolescents' Self-Adjustment. *International Education Studies*, *7*(10), 66–73.

Jost, C. C., Mariner, J. C., Roeder, P. L., Sawitri, E., & Macgregor-Skinner, G. J. (2007). Participatory epidemiology in disease surveillance and research. *Revue Scientifique Et Technique-Office International Des Epizooties*, *26*(3), 537.

Lee, J. S. W., Auyeung, T.-W., Kwok, T., Lau, E. M. C., Leung, P.-C., & Woo, J. (2007). Associated factors and health impact of sarcopenia in older Chinese men and women: a cross-sectional study. *Gerontology*, *53*(6), 404–410.

Offia Ibem, E., Anosike, M. N., Azuh, D. E., & Mosaku, T. O. (2011). Work stress among professionals in the building construction industry in Nigeria. *Australasian Journal of Construction Economics and Building, The*, *11*(3), 45–57.

Rachman, N. M., Efendi, A., & Wicaksana, E. (2011). *Panduan lengkap perencanaan CSR*. Penebar Swadaya Grup.

Semple, S. C., Judge, A. D., Robbins, M., Klimuk, S., Eisenhardt, M., Crosley, E., Leung, A., Kwok, R., Ambegia, E., & McClintock, K. (2011). *Preclinical characterization of TKM-080301, a lipid nanoparticle formulation of a small interfering RNA directed against polo-like kinase 1*. AACR.

Sugiyono, P. D. (2013). Metode penelitian manajemen. *Bandung: Alfabeta, CV*.

Vasconcelos, O. M., Poehm, E. H., McCarter, R. J., Campbell, W. W., & Quezado, Z. (2006). Potential outcome factors in subacute combined degeneration. *Journal of General Internal Medicine*, *21*(10), 1063–1068.

Wulandari, N. E., & Mutmainah, S. (2011). *Pengaruh Partisipasi Penyusunan Anggaran Terhadap Kinerja Aparat Pemerintah Daerah: Kepuasan Kerja dan Komitmen Organisasi Sebagai Variabel Moderating (Studi Empiris Pada Pemerintah Daerah Kabupaten Demak)*. UNDIP: Fakultas Ekonomika dan Bisnis.