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THE CORRELATION BETWEEN WORK DURATION AND WORKLOAD AGAINST WORK FATIGUE

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Abstract

Background: The causative factors of work fatigue consist of two aspects, namely external (work and work environment) and internal (individual characteristics), where these factors can affect productivity and work performance that can trigger work accidents. The X bridge construction project can't be separated from the onset of work fatigue problems due to work using physical strength especially coupled with erratic weather, especially when it is hot and heavy workload plus more if there are additional hours of work (overtime). The workers had to work every day to complete the construction in order to be completed on time.

Aims: Analyze the Relationship Between Work Duration and Workload Against Work Fatigue

Methods: The research design used is a cross sectional approach. The research population was all 46 workers in the construction of the X bridge and the total sample of the study was 42 workers.

The sampling technique in this study was Simple Random Sampling.

Result: that there was no correlation between years of work and the level of work fatigue on the construction workers of the X bridge with a p value of: 1,000. There was a correlation between workload and the level of work fatigue on the construction workers of the X bridge with p value: 0.000.

Conclusion: Providing preventive information against work fatigue is indispensable. Workers are expected to make good use of existing rest periods and choose the type of work that suits their physical condition.

Keywords: Workload, Work Duration, Work Fatigue

Introduction

All types of work both formal and informal cause work fatigue. Fatigue is a subjective feeling, but it is different from weakness and has gradual properties. One of the problems related to health and comfort at work is work fatigue. Factors that cause work fatigue are two aspects, namely external aspects (work environment and work) and internal aspects (individual characteristics). Elements of work include workload, shift work, and work period. Based on data from the International Labour Organization (ILO) in 2019 showed about 32% of the world's workers experience fatigue due to the work they do. The rate of complaints of severe fatigue in workers worldwide ranges from 18.3-27% and the prevalence rate of industrialized fatigue is 45%². While work accidents that resulted in 60% deaths occurred in the agricultural, construction, transportation, fisheries, forestry, and warehousing sectors¹. The World Health Organization (WHO) has a health model created until 2020, which estimates psychological disorders in workers such as feeling tired so severe and leading to depression can be the number two killer disease after heart disease.

The construction of the Bridge Project was made by Indonesian state-owned enterprises (BUMN) engaged in construction. The X bridge construction project is inseparable from the onset of work fatigue problems due to work using physical strength especially coupled with erratic weather, especially when it is hot and heavy workload plus more if there are additional hours of work (overtime). Workers must also continue to work every day to complete the bridge project to

be completed on time. We used the initials for the place in this study out of respect for privacy and confidentially also requested from the project manager.

Working period is the period or length of time a person works in an agency, office, and so on. Working time is also a relationship with the length of time after working somewhere. Based on direct interviews 10 out of 10 workers of the X bridge construction project have been working on average from the beginning of the project until now approximately 5 months. ² The results of research showed that there is a relationship between working time and work fatigue in PT. Kalla Kakao Industries of 46 respondents, most respondents have a new working period of 16 people (34.8%) and a long working period of 30 people (65.2%)³.

⁹ Workload is a difference between the capacity or ability of workers and the demands of the job that must be faced, considering that 9 out of 12 respondents of this job experience fatigue due to workload because in working physically, ³² then each has a different level of loading can be seen based on the age of the worker for young workers surely the level of fatigue is not so felt compared to the age of the elderly who feel tired enough due to the age factor. A and his physical strength. ⁸ Any job of any kind whether it requires muscle strength or thinking is a burden on those who do ⁸ the job. Due to too heavy workload or weak physical abilities, it can result in a worker suffering ²¹ from occupational disorders or illnesses. Based on research conducted by states that there is a significant relationship between workload and fatigue⁴.

⁵ This is what prompted researchers interested in conducting research on working time, workload and work fatigue in bridge construction workers X, as well as to prove whether ²⁸ there is a relationship between working time and ¹⁰ work fatigue in bridge construction workers X, and whether there is a relationship between workload and work fatigue in bridge construction workers X.

Methods

This research is a type of quantitative research. The research design used is a correlation method with the Cross Sectional approach. The research was conducted on the X bridge construction project for 1 month. The variables used are workload and workload. The population in this study was all 46 workers of bridge construction X. The sample taken from the study was 42 workers. The sampling technique in this study used Simple Random Sampling. Simple Random Sampling is that each member has the same opportunity to be selected as a sample. The exception criteria in the study were workers who were not in place at the time of the study due to illness, death or permits, workers who had a history of illness and a working age of less than 65 years. Using a Subjective Self Rating Test questionnaire from Japan's Industrial Fatigue Research Committee (IFRC) to measure work fatigue. Data collection techniques use interviews and questionnaires and data sources in the form of primary data and secondary data. Data analysis using the Chi Square Test.

Results

A. Univariate Analysis

Table 1. Frequency Distribution Based on Age

No	Age	F	(%)
1	Mature 26-45 Years Old	23	54,8
2	Elderly 46-65 Years Old	19	45,2
	Total	42	100,0

Based on table, it is known that most of the respondents aged between 26-45 years old amounted to 23 respondents with a percentage of 54.8% while for the elderly aged 46-65 years old there were 19 respondents with a percentage of 45.2%.

Table 2. Frequency Distribution Based on Working Duration

No	Work Duration	F	(%)
1	9 Month	31	73,9
2	<9 Month	11	26,1
Total		42	100,0

Based on table, it is known that most respondents have a working Duration of 9 months amounting to 31 respondents with a percentage of 73.9% while for the working Duration of <9 months a total of 11 respondents with a percentage of 26.1%.

Table 3. Frequency Distribution Based on Workload

No	Workload	F	(%)
1	Light Workload	9	21,4
2	Heavy Workload	33	78,6
Total		42	100,0

Based on table it is known that most respondents have a heavy workload of 33 respondents with a percentage of 78.6% while for light workload of 9 respondents with a percentage of 21.4%.

B. Bivariate Analysis

Table 4. Bivariate Analysis between Variables using Chi Square Test

Variable	Category	Work Fatigue				P
		Tired		Not Tired		
		f	%	f	%	
Work Duration	9 Month	22	70,97	9	29,03	1,000
	<9 Month	8	72,8	3	27,2	
RP (95% CI) : 0,917 (0,917-4,263)						
Workload	Light Workload	1	11,11	8	88,89	0,000
	Heavy Workload	29	87,87	4	12,13	
RP (95% CI) : 0,017 (0,002-0,1777)						

Based on table, it can be known that the working duration of 9 months experienced work fatigue as many as 22 workers (70.97%) while for the working duration of <9 months who experienced work fatigue as many as worker (72.8%). The results of the chi-square test analysis of the

relationship between work duration and work fatigue in workers showed results $p = 1,000 > 0.05$. So it can be concluded that statistically there is no relationship between working time and work fatigue value of RP amounting to 0.917, so that the working period of <9 months is at risk of 0.91 times experiencing work fatigue compared to the working period of 9 months (95% CI = 0.197-4,263).

Based on the table 4, the light workload experienced work fatigue as much as 1 worker (11.11%) while for heavy workload experienced work fatigue as many as 29 workers (87.87%). The results of the chi-square test analysis of the relationship between workload and work fatigue in workers showed a result of $p = 0.000 < 0.05$. It can then be concluded that statistically there is a relationship between workload and work fatigue value RP 0.017, and 95% Confident Interval (CI) = 0.002-0.177, meaning that workload is not a major factor in the incidence of work fatigue in the worker.

DISCUSSION

1. Relationship between variable working life and work fatigue

Based on the results of bivariate analysis using statistical tests using chi-square tests with the aim to find out if there is a relationship between variable working life and work fatigue in bridge construction workers X. Based on the working period of the 9-month category that experienced work fatigue of 70.97% (22 respondents) because of the work they do every day so they feel bored coupled with often there are additional hours of work and category 9 months that do not experience work fatigue by 29.03% (9 respondents) because of their physical condition and feel unencumbered by the work done.

Category <9 months who experienced work fatigue by 72.8% (8 respondents) because they were not familiar with the type of work done so felt burdened coupled with the condition of the

work environment and working hours that exceeded the limit and the category of <9 months who did not experience work fatigue by 27.2% (11 respondents) because they had just joined this job but they were used to the type of project work with the type of heavy work. The results of the chi-square test analysis of the relationship between working time and work fatigue in workers showed a result of $p = 1,000 > 0.05$. It can then be concluded that statistically there is no relationship between working time and work fatigue in bridge construction workers X.

The absence of a relationship between working time and work fatigue in bridge construction workers X does not fit with Suma"mur,2014 theory which states that working period greatly affects workers because it causes routines in work. Workers who have worked more than 5 years have a good influence in work and workers who have only worked less than or equal to 5 years can have a less good influence in the work. Working life can affect performance both positively and negatively. Working period forms a positive influence when the perception of carrying out the task responsibly and alertly.

Negative influence when the perception that arises underestimates a task without thinking about the rules that have been made by institutions and tend to do harm. The longer a person's working life is also proportional to efficiency and productivity. The longer you work somewhere, the more likely you are to be exposed to the working environment of physics, chemistry, biology, and some of them. The working period is usually calculated by the unit of year. The longer he worked, the more likely he was to suffer from the disease that could result from his work. The longer a person works somewhere, the more likely they are to be exposed to environmental factors in their workplace. Work both physical and mental can cause health problems or diseases due to work so that it will result in the efficiency and productivity of the

work of a workforce. A person's working life determines his efficiency and productivity and can avoid fatigue.

This is in line with the results of a study conducted by Mariani J, 2017 related to showing that there is no relationship between working time and work fatigue. Based on the results of chi-square analysis obtained value $p\text{-value} = 0.337$, it can be interpreted that there is no relationship between working time and work fatigue. A working period of 2 years is a long time for workers to adapt and adjust to daily activities at work. But in this study employees who have a working period of ≥ 2 years more experience high fatigue, this is likely due to the tendency of employees to have a working period of ≥ 2 years which is as many as 48 people while employees who have a working period of < 2 years as many as 27 people. In addition, the presence of other factors that affect, such as: the monotony of work, the physical environment of work, and individual factors can be a trigger for fatigue⁵.

Based on research it can be concluded that a longer working period has a risk of experiencing work fatigue than those who have just worked. This is because the energy intake consumed during work activities and the habit of not having breakfast before work so that it affects its performance during work because it is not balanced between the energy intake consumed with the energy released. In addition to energy intake, respondents who experience fatigue, but are still in the new working period category can also be caused by high workload and work attitudes that are not ergonomic.

2. Relationship between workload variables and work fatigue

Based on the results of bivariate analysis using statistical tests using chi-square tests with the aim to find out if there is a relationship between workload variables and work fatigue in

bridge construction workers X. Based on the category of light workload that experienced work fatigue by 11.11% (1 respondent) because the workload related to physical is too burdensome in addition to lack of energy intake and the category of light workload that did not experience work fatigue by 88.89% (9 respondents) because they felt comfortable with the work they did and were used to work activities done.

The category of heavy workload that experienced work fatigue by 87.87% (29 respondents) due to excessive working hours, workload borne and age factors that affect a person's physical endurance in doing work and the category of heavy workload that does not experience work fatigue by 12.13% (4 respondents) because it is influenced by young age factors so that they have good physical endurance and energy intake factor Meet before doing work activities. The results of the chi-square test analysis of the relationship between workload and work fatigue in workers showed a result of $p = 0.000 < 0.05$. It can then be concluded that statistically there is a relationship between workload and work fatigue in bridge construction workers X.

The relationship between workload and work fatigue in bridge construction workers X in accordance with Suma"mur"mur,2014 theory which states that the light weight of workload received by a person's workforce can be used to determine how long a laborer can perform his work activities in accordance with the ability or capacity of work concerned⁶. Where the heavier the workload, the shorter the time a person works to work without fatigue and significant physiological disorders or vice versa. If the worker's ability is higher than the demands of the job, there will be a feeling of boredom. Conversely, if the ability of workers is lower than the demands of work then there will be excessive fatigue⁷. The workload in this study is the level of workload obtained by measuring the worker's pulse and expressed in units of pulse / minute. The workload in this study is divided into 2 categories, namely the weight category if obtained

the calculation of pulse ≥ 100 beats / minute and the light category if obtained the calculation of pulse < 100 beats / minute.

This is in line with the results of research conducted by Mulyadi, 2019 related to work fatigue in furniture workers who stated that there is a significant relationship between workload and fatigue. work fatigue in furniture workers because it is influenced by poor work attitude factors will add to the workload on the muscles⁸. Heavy workload conditions such as pushing or pulling, as well as lifting wood or other objects over long distances can affect work fatigue as much as (53%) and as many as (90%) workers who do repetitive activities every day and push loads excessively. Then the pulse will immediately change in line with changes in loading, both derived from mechanical, physical, and chemical loadings that cause changes in heart rhythm.

Based on research it can be concluded that heavy workload has a risk of experiencing work fatigue compared to a light workload. This is due to the unequal division of work towards the workers. Each workload must be in accordance with the physical ability, cognitive ability, and limitations of the person who receives the workload. The light weight of workload received by a person's workforce can be used to determine how long a laborer can do his job with the ability to have. Where the heavier the workload, the shorter the work time to work without fatigue and physiological disorders.

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