ANALYSIS OF FATIGUE WORK FACTORS IN CONSTRUCTION WORKERS OF PT. MANDALA PUTERA PRIMA IN THE BANK INDONESIA KARAWANG PROJECT IN 2023

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ABSTRACT
Labor as an investment asset needs to work properly and correctly, among others, by taking into account the factors that may cause fatigue. As is known, that by increasing organizational performance through handling ergonomic work procedures is one way to increase productivity and prevent work accidents. Research to find out the analysis of fatigue work factors in construction workers of PT. Mandala Putera Prima in The Bank Indonesia Karawang Project Tahun 2023. This type of analytic observational research with a cross-sectional study approach. The result from this research is 90.5% of workers aged <30 years experience more symptoms of work fatigue with a p-value > 0.05, namely 0.661, 95.0% have a working period of 2-5 years, experience symptoms of work fatigue with a p-value > 0.05, namely 0.708, duration of work > 8 hours, 90.5% experienced symptoms of work fatigue with a p value > 0.05, namely 0.825 and heavy workload with symptoms of work fatigue, 80.0% experienced symptoms of work fatigue with a value of p > 0.05, namely 0.218. The risk of work fatigue in construction worker activities has a risk of the symptoms of the disease occurring. Workers with a risk of symptoms of work fatigue recommend that to reduce the risk of work fatigue workers get used to getting enough sleep 7-8 hours a day and eating a balanced diet (mainly vegetables and fruits).

Keywords: Work Fatigue, Construction, Fatigue Work Factors

INTRODUCTION
Occupational Safety and Health (OHS) is the interest of employers, workers, and governments around the world. According to estimates by the International Labor Organization (ILO), every year around the world 2 million people die due to work-related problems (1). Of this number, 354,000 people had fatal accidents. In addition, every year 270 workers experience work-related accidents and
160 million suffer occupational diseases. The costs that must be incurred for the hazards due to this work are very large. The ILO estimates that the losses suffered as a result of work-related accidents and diseases annually are more than US$1.25 trillion (2).

Law No. 1 of 1970 concerning work safety considers that every worker has the right to protection for his safety in carrying out work for the welfare of life and to increase national production and productivity, that every other person who is in the workplace must also have his safety guaranteed, that every source production needs to be used and used safely and efficiently (3). In a survey in the USA, fatigue is a big problem. It was found that 24% of all adults who came to the polyclinic suffered from chronic fatigue. Almost the same data can be seen in a community held by Kendel in England which states that 25% of women and 20% of men always complain of tiredness (Setyawati, 1994). Another study that evaluated 100 people suffering from fatigue showed that 64% of fatigue cases were caused by psychological factors, 3% due to physical factors, and 33% due to these two factors (Setyawati, 1994). The results of a study on the relationship between age, length of work, and years of service to fatigue by I Made Pujawan and Rajen Nimrod on pinisi boat craftsmen in Bulukumba, found that the greatest fatigue complaints were felt by all workers in the age group over 30 years compared to the age group under 30 years after work in a day. Meanwhile, regarding the relationship between tenure and fatigue, it was found that from respondents who experienced fatigue, the highest fatigue complaints were experienced by workers with long category 3 working years (> 5 years), namely as many as 46% (4)(5)(6)(7).

Excessive working time can increase human error or work errors due to increased fatigue and reduced sleep hours. Working hours for workers in the private sector have been regulated in Law Number 13 of 2003 concerning Manpower, In a week a person can usually work well for 40-50 hours. The provisions for working hours have been regulated in two systems, namely 7 working hours in one day or 40 working hours in one week for 6 working days in one week (8). Or 8 hours of work in one day or 40 hours of work in 1 week for 5 working days in 1 week. More than that, it is likely that negative things will arise for the workforce concerned and the work itself. The longer the working time in a week, the greater the tendency for unwanted things to happen (9)(10).

Construction workers are jobs that have a high level of fatigue (5)(11)(10). Construction workers tend to use their physical abilities when working. Building work consists of work on the stone section, excavation section, iron section, steel section, and others. If this work is combined with a heavy workload, excessive energy demand on workers will cause worker fatigue, reduce worker performance by reducing work speed, and increase the risk of errors while working (Nurmianto, 2003). Tarwaka, 2015 stated that workload is one of the problems that workers often face (12). The workload can be in the form of physical loads and mental loads. Any workload received by workers must be on the physical abilities, cognitive abilities, and limitations of the humans who receive the burden cited in (11).
METHOD

The type of research used is analytic observational research with a cross-sectional study approach. It aims to see the relationship between the independent variable to the dependent variable, namely the relationship between age, years of service, duration of working time, and workload on work fatigue in construction workers at PT. Mandala Putera Prima at Bank Indonesia Karawang Project in 2023. The data used uses primary data and interview data from the results of questionnaires filled out by respondents consisting of Characteristics of Respondents and the IFRC Questionnaire (SSRT: subjective self-rating test). Furthermore, to calculate the workload used the 10 beats method using a stopwatch. This method can calculate the working pulse rate as follows:

\[
\text{Pulse} = \frac{10 \text{ pulses} \times 60}{\text{Calculation time}}
\]

As for how to measure the pulse with the 10-pulse method, namely by placing the fingertips of the second, third, and fourth hands above the surface of the skin on the wrist. When the measurement starts, the stopwatch is turned on for 10 seconds, then multiplied by 6 to get the result of one minute and for 10 seconds the stopwatch is turned off, then the pulse rate is recorded. The collected data will be processed using a data processing application. Methods of data analysis using univariate analysis to get an overview of the frequency distribution of each variable and bivariate analysis to see the relationship and the magnitude of the relationship between the independent variables (age, years of service, duration of work time, and workload) with the dependent variable work fatigue.

RESULTS AND DISCUSSION

Demographic characteristics of workers are presented in Table 1. The majority of workers are aged <30 years (52.3%), most of the respondents have worked for more than 5 years (47.7%), the majority of respondents work more than 8 hours a day (95.5%), and the majority of 10 respondents with workload in the heavy category (22.7%). Workers who work have different levels of risk of fatigue which can have various risks of fatigue while working. The score shown is based on Yoshitake (1971), Industrial Fatigue Research Committee (IFRC) Japan in Table 2.

| Table 1. Demographic Characteristics of Respondents |
|---------------------------------------------------|--------|--------|
| Respondent Characteristics | n | %     |
| Age | | |
| < 30 years | 23 | 52.3 |
| ≥ 30 years | 21 | 47.7 |
| Years Of Service | | |
| < 1 years | 2 | 4.5 |
| 1-2 years | 1 | 2.3 |
| 2-5 years | 20 | 45.5 |
| > 5 years | 21 | 47.7 |
Table 2. Fatigue Risk Level

<table>
<thead>
<tr>
<th>Fatigue level</th>
<th>Score</th>
<th>Classification</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30 – 52</td>
<td>No fatigue</td>
<td>No corrective action is required</td>
</tr>
<tr>
<td>2</td>
<td>53 - 120</td>
<td>Fatigue ensues</td>
<td>Action required</td>
</tr>
</tbody>
</table>

Symptoms of fatigue risk in workers have presented in Table 3. 40 respondents experienced symptoms of fatigue (90.9%) and 4 respondents experienced no fatigue (9.1%).

Table 3. Fatigue Risk Levels of Respondents

<table>
<thead>
<tr>
<th>Fatigue Level</th>
<th>n</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No fatigue</td>
<td>4</td>
<td>9.1</td>
</tr>
<tr>
<td>Fatigue ensues</td>
<td>40</td>
<td>90.9</td>
</tr>
</tbody>
</table>

The results of the data obtained regarding the correlation between the independent variables (Age, Work Mass, Work Duration, and Workload) with the dependent variable (Work Fatigue) have a variety of different interpretations such as: Increasing age will be followed by a process of degeneration of the organs so that in this case the ability of the organs will decrease. The decreased ability of the organs will cause the younger workforce to experience fatigue. From a total of 44 respondents, 21 respondents aged less than 30 years (91.3%) experienced more work fatigue than respondents who were more than 30 years old.

One indicator of work tenure for workers tends to be related to work productivity, the longer a person works the higher his productivity because he is more experienced and has good skills. A person's working time determines his efficiency and productivity. Extended working time ability and not accompanied by high efficiency usually shows a decrease in productivity and a tendency to fatigue, illness, and accidents. Of the 44 total respondents, there were 19 respondents with a working period of 2-5 years who most experienced symptoms of work fatigue that needed follow-up, while there was only 1 respondent with a working period of less than 2-5 years who did not experience symptoms of work fatigue.
Someone who works continuously at some point will experience fatigue. Both jobs that require physical exertion and jobs that require brain work. Fatigue can be in the form of physical and mental exhaustion, that's when people need rest before all their energy runs out. Manpower Act No. 25 of 1997 Article 100 Paragraph 2 that the required working time for workers is 8 (eight) hours a day or 40 hours a week for 5 (five) working days a week. While the results of 90.5% of respondents who work with a duration of working time in day of more than 8 hours experience symptoms of work fatigue. The reason for some respondents working more than 8 hours a day is because of the overtime hours, the more overtime each day the respondent has, the more monthly wages he will receive.

A good workload is a workload given to employees that exceeds their work capacity. If the workload provided is balanced with the work capacity of employees, optimal performance conditions will occur. However, on the contrary, there will be a decrease in work performance if the workload is too high. In measuring the level of workload on work fatigue in some respondents there were 8 people or 80.0% of respondents who felt a heavy workload and experienced complaints of symptoms of work fatigue (6)(13)(14)(15).

CONCLUSION AND SUGGESTIONS

The risk of work fatigue in construction worker activities has a risk of symptoms of the disease occurring. The highest risk is in activities or work processes because of the duration of work and also the heavy workload and mentality, this is due to work carried out with long duration of work in a day and the perceived workload is quite high on work activities. The highest proportion of symptoms of work fatigue was found in the duration of work with 95.5% of those working for long durations...
experiencing these symptoms. Symptoms of work fatigue are not related to age, length of work, duration of work day, and length of work. We recommend reducing the risk of work fatigue in the final inspection to suggest that workers get used to getting enough sleep 7-8 hours a day. Consume a balanced nutritional diet (especially vegetables and fruits), don't consume alcohol, manage stress well, do regular exercise, don't smoke, and need to do regular stretching every day. It is necessary to provide workers with training or training on the risks of work fatigue in the workplace and follow the required work procedures properly.

ACKNOWLEDGMENT

Limiting Researchers express gratitude to all parties involved in the settlement research and scientific articles. Through some processes and stages that researchers do. Hopefully, this article can be useful for development journals and for readers in the safety field and occupational health.

REFERENCES


