**RELATIONSHIP OF INDIVIDUAL CHARACTERISTICS, WORK EXPENSES AND BREAK TIMES WITH FATIGUE AT FATMAWATI CITY CENTER APARTMENT PROJECTS, 2020**

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**ABSTRACT**

Background: Work fatigue is a state of decreased health status, loss of efficiency, and decreased workforce capacity to do a job. Based on data obtained by the European Agency for Safety and Health (EA-OSHA) in 2003-2005 states in the construction sector the fatigue factor is 1.1%. Fatigue in construction workers is caused by work factors (workload, rest periods, length of work, work shifts and duration of work), individual factors (age, sex, sleep quality, nutritional status), and environmental factors (lighting, noise and work climate). The purpose of this study was to analyze the relationship between individual characteristics, workload, and rest time with fatigue in workers at the Jakarta Fatmawati City Center construction project. Methods: This research is a quantitative analytic study with cross-sectional study design. The sampling technique uses purposive random sampling with a sample of 88 workers. The variables studied were individual characteristics (age and quality of sleep), workload, rest periods, length of work, and fatigue using a questionnaire measuring the feeling of work fatigue (KAUPK2), Pittsburgh Sleep Quality Index (PSQI) and pulse oximeter. Data analysis using the Chi-Square test. Results: The results of the bivariate analysis showed that there was a relationship between age (p = 0.001), sleep quality (p = 0.001), workload (p = 0.001) and length of work (p = 0.002) with fatigue, while variables not related to fatigue were rest periods (p = 0.542). Conclutions: There is relationship between age, sleep quality, workload and length of work with fatigue

**Keywords:** Fatigue, Workload, Rest Time

1. INTRODUCTION

Fatigue is very common for most workers while doing work. Fatigue is a very common condition in life. Fatigue refers to a state of reduced energy to carry out activities [1]. Fatigue caused by work is part of the process of reducing performance and efficiency at work, as well as decreasing muscle strength in the body in carrying out the activities carried out [2]. Fatigue is common in construction workers. This is because the activities in construction projects are dynamic with a certain time and schedule so that effective human resources are needed [3]. Also, construction workers are required to do physical work in the project environment which has a high risk of injury and ill-health [4].

According to the ILO (2013), in a year many workers who lose as many as two million workers lose their life, due to fatigue. In this study, as many as 58,115 samples, 18,828 people (32.8%) felt tired. If a person experiences fatigue and a work accident occur, it will directly impact his work productivity [5]. Surveys in America, show fatigue is a very big problem. More than 20% of the working population everyday experience work fatigue resulting in loss of productivity [9]. Based on BPJS Ketenagakerjaan data, work accidents show an increasing trend. In 2017, 123,041 cases were reported for work accidents, while in 2018 there were 173,105 cases [10]. In 2010 PT Jamsostek and the Indonesian Ministry of Manpower recorded as much as 31.9% of the construction sector contributed to all work accidents. The construction sector ranks first in work accidents in Indonesia. Fatigue at work is one of the main causes of injuries and accidents in construction [11]. Factors that affect fatigue are divided into 2 (two) things, such as individual factors (such as gender, sleep quality, age, nutritional status, etc.) and occupational factors (such as workload, length of work, and environment) [12].

The Fatmawati City Center Jakarta apartment construction project is one of the constructions that does not apply work shifts. However, it has a long working time of more than 8 hours/day because it is required to overtime by the company with working hours that vary, among others, 06.00-15.00 WIB, 07.00-16.00 WIB and 08.00-17.00 WIB with a break time from 12.00-13.00 WIB and will resume work at 19.00-21.00 WIB with rest hours at 18.00-19.00 WIB. This allows for a relationship between the length of work and fatigue and heavy workload in a construction environment and individual characteristics such as age and sleep quality can affect fatigue.

Therefore it is necessary to do research related to the relationship of individual characteristics, workload, and rest time with fatigue in the Fatmawati City Center Jakarta apartment project workers.

1. **METHODS**

The method used was quantitative analytic research using a cross-sectional research design. The research was conducted in April-June 2020. The data collection technique used in this research was purposive random sampling. The total sample obtained was 88 workers. Retrieval of this research data using the Questionnaire Measuring Fatigue Feelings of Work (KAUPK2), the Pittsburgh Sleep Quality Index Questionnaire (PSQI), and pulse oximeter as a measuring tool for pulse recovery.

1. **RESULTS**

 The results of this study are the results of univariate and bivariate analysis. The univariate analysis describes the frequency distribution based on occupational factors (workload, rest time, and length of work) and individual factors (age and sleep quality). Meanwhile, bivariate analysis is used to analyze the relationship between workload, rest time, length of work, age, and sleep quality with fatigue in construction workers for the Fatmawati City Center Jakarta apartment construction project in 2020.

**Table 1** Distribution of Work Fatigue Frequency, Age, Sleep Quality, Workload, Rest Time and Length of Work

|  |  |  |
| --- | --- | --- |
| **Variable** | **Frequency** | **Precentage (%)** |
| **Work Fatigue:**Less TiredTired | 2959 | 33,067,0 |
| **Age:**≤ 40 years> 40 years | 2860 | 31,868,2 |
| **Sleep Quality:**WellBad | 3058 | 34,165,9 |
| **Workload:**LightWeight | 3850 | 43,256,8 |
| **Rest Time:**Without RiskRisk | 5731 | 64,835,2 |
| **Length of working**≤ 8 hours / day> 8 hours / day | 2365 | 26,173,9 |
| **Total** | 88 | 100,00 |

**Table 2** Relationship between Workload, Rest Time, Age and Sleep Quality with Fatigue

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Work Fatigue** | **Total** | **P*value*** |
| Less Tired | Tired |
| n | % | n | % | N | % |  |
| **Age:** ≤ 40 years > 40 years | 218 | 23,99,1 | 752 | 8,059,1 | 2860 | 100 | 0,001 |
| **Sleep Quality:** Well Bad | 1811 | 20,512,5 | 1247 | 13,653,4 | 3058 | 100 | 0,001 |
| **Workload:** Light Weight | 236 | 26,16,8 | 1544 | 17,050,0 | 3850 | 100 | 0,001 |
| **Rest Time:** Without  Risk Risk | 1712 | 19,313,6 | 4019 | 45,521,6 |  5731 | 100 | 0,542 |
| **Length of working** ≤ 8 hours/ day> 8 hours/ day | 1415 | 15,917,0 | 950 | 10,256,8 | 2365 | 100 | 0,002 |

1. **DISCUSSIONS**

Work Fatigue at the Fatmawati City Center Apartment Project in Jakarta

Fatigue is a state of fatigue both mentally and physically that occurs as a result of prolonged activity and can reduce a person's skills in carrying out their work safely and effectively [13]. A person who experiences fatigue accompanied by a feeling of difficulty thinking, tired of speaking, nervous, difficult to concentrate, unable to focus on something, tends to forget, lacks self-confidence, lazy in doing a job, is reluctant to look at others, is reluctant to work deftly, feels uneasy comfortable in doing a job, feeling tired in the whole body, tend to be sluggish, feeling tired before working, reduced thinking power and anxious about something [14]. In this study, interviews were conducted with 88 workers of the Fatmawati City Center apartment construction project using a questionnaire measuring the feeling of work fatigue (KAUPK2) to determine the level of fatigue experienced by workers. This questionnaire is a subjective questionnaire that has a list of 17 items. Based on the results obtained, as many as 59 workers (67.0%) were in the tired category with a score between 20-35. Meanwhile, 29 other workers are in the less tired category with a score of <20. This can be caused by excessive workload and long working time and age that has reached above 40 years, causing factors that influence fatigue, namely in the form of individual factors (age and sleep quality) and work factors (workload, rest time, and length of work).

Relationship between Age and Fatigue

The results in this study show that as many as 60 workers are at risky age (> 40 years) and there are 52 workers (59.1%) who feel tired at work and 28 workers who are included in the non-risk age (≤ 40 years) there are 7 workers. (8.0%) felt tired at work. From the results of statistical tests using the chi-square p-value obtained p-value 0.001 (p ≤ 0.05), it means that workers with age more than 40 years have a significant relationship with work fatigue.

This research is supported by research conducted by [17] which states that there is a relationship between age and fatigue as evidenced by a p-value of 0.006 (≤ 0.05) and research conducted by [8] with a p-value of 0.008. However, it is not in line with research conducted by [19] with a p-value of 1,000 (> 0.05) because fatigue can attack all ages regardless of certain age groups.

The Relationship between Sleep Quality and Fatigue

Based on the results obtained, this study shows that of the 58 workers with poor sleep quality, 47 workers (53.4%) felt tired and of the 30 workers in the good sleep quality group there were 12 workers (13.6%) who experienced fatigue. The results of statistical tests using chi-square get p-value 0.001 (p ≤ 0.05). It can be said that there is a relationship between sleep quality and work fatigue. This is the following research conducted by [18] which states that there is a relationship between sleep quality and fatigue in construction workers at PT. X Semarang City with a p-value of 0.02 (p ≤ 0.05). In this study, it was found that many workers experienced fatigue with poor sleep quality. The average sleep time for workers in the Fatmawati City Center Jakarta apartment construction project is 6 hours. This is not consistent with the statement [15] that sleep requirements vary from person to person. However, the average is 7-8 hours a day. So, someone who can't sleep well in one full night will feel tired the next day.

Workload Relationship with Fatigue

 Working as a construction worker is a job that uses a lot of physical strength in doing a job. The workload in this study focuses on physical workload. The workload is obtained by measuring using a pulse oximeter on the worker. Measurements were made three times and pulse recovery was calculated at the end of 30 seconds in the first, second, and third seconds [16]. Based on the data obtained, 50 workers who experienced fatigue with heavy workloads were 44 workers (44.0%) and 15 workers (17.0%) with light workloads which were included in the tired category. The results of statistical tests with chi-square obtained p-value 0.001 (p ≤ 0.005).

This suggests that there is a meaningful relationship between physical workload and fatigue. The more physical workload that is received, the easier it is for a worker to feel tired because according to [17] a job with an excessive workload or that exceeds the limit of a worker will result in fatigue and accidents in workers and can interfere with the quality of work of a worker.

This research is in line with the research conducted by [12] which states that there is a relationship between physical workload and fatigue p-value 0.003 (p ≤ 0.05) and research conducted by [7] states that there is a significant relationship between workload and fatigue p-value 0.002 (p ≤ 0.05). This shows that the greater the physical workload, the more abundant the level of work fatigue is felt [15].

Rest Time Relationship with Fatigue

Based on the results obtained, it shows that there are 57 workers, there are 40 workers (45.5%) who have a rest time that is not at risk (≥ 30 minutes / 4 hours) is included in the tired category and 19 workers (21.6%) who have a risky rest time. (<30 minutes / 4 hours) is categorized as tired. The statistical test results using the chi-square obtained p-value 0.542 (p> 0.05). So it can be concluded that there is no significant relationship between rest time and fatigue in workers of the Fatmawati City Center Jakarta apartment construction project. This research is supported by research conducted by [12] which states that there is a significant relationship between rest time and fatigue p-value 0.05 (p ≤ 0.05). Workers felt tired due to work at the Fatmawati City Center Jakarta apartment construction project, the majority of whom were in the category of non-risk rest time (≥ 30 minutes / 4 hours) as many as 40 workers (45.5%).

Length of Work Relationship with Fatigue

PT Multikon Adhitama Tbk in the construction of the Fatmawati City Center apartment project does not apply a work shift system due to requests from the surrounding community not to interfere with their activities at midnight. However, companies provide working hours that vary with working hours of 8 hours/day and allow workers to take overtime or not. Based on the results obtained from 65 workers who get risky working hours (≥ 8 hours/day) who feel tired as many as 50 workers (56.8%) and 9 workers (10.2%) who feel tired during working hours that are not at risk ( <8 hours/day). The results of statistical tests using chi-square showed a p-value of 0.002 (p ≤ 0.05). It can be interpreted that there is a significant relationship between the length of work and fatigue. Working hours of more than 8 hours/day will trigger boredom and fatigue with work and require workers to do activities at night to complete their work.

This forms the time that should be used for another life and forced to be used for work [21]. This research is supported by research conducted previously by [6] which states that there is a significant relationship between the length of work and fatigue with a p-value of 0.023 (p ≤ 0.05) and research conducted by [22] with a p-value of 0.002 (p ≤ 0.05).

1. **CONCLUSION**

 Based on the results of research on workers of the Fatmawati City Center Jakarta apartment construction project, it can be gathered as follows:

* 1. In this study, the results showed that most workers felt tired in the tired category as many as 59 respondents (67.0%), 60 respondents (68.2%) aged over 40 years (68.2%), had poor sleep quality as many as 58 respondents (65.9%). ), the workload felt by workers is mostly in the heavy category as many as 50 respondents (56.8%), the majority of workers get a rest time of more than 30 minutes as many as 57 respondents (64.8%) and most workers get a long time off work more than 8 hours as many as 65 respondents (73.9%).
	2. There is a relationship between age and sleep quality with work fatigue in workers of the Fatmawati City Center Jakarta apartment construction project in 2020
	3. There is a relationship between workload and work fatigue in workers of the Fatmawati City Center Jakarta apartment construction project in 2020
	4. There is a relationship between the length of work and work fatigue in workers of the Fatmawati City Center Jakarta apartment construction project in 2020
	5. There is no relationship between rest time and work fatigue in workers of the Fatmawati City Center Jakarta apartment construction project in 2020

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