Age, Working Hours, Workload with Work Fatigue Among Office Workers

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Abstract: Work fatigue is a kind of problem related to work health and comfort which also has an impact on work productivity. Acording to the International Labour Organization (ILO), work accidents due to work fatigue lead do the death of two million workers for almost every year. This study aims to determine the correlation between age, working hours and workload with work fatigue among workers in the Office department of PT X Cirebon. The current study applied a quantitative type with a cross sectional design. The study population involved 63 office workers at PT X in 2024. The study samples were selected using total sampling technique. A questionnaire sheet was used to collected data through interviews. Data analysis applied the Chi-Square test. The test result revealed a correlation between age (p value = 0.032), working hours (p value = 0.004), and workload (p value = 0.000) with work fatigue among office workers. It can be concluded that there was a correlation between age, working hours, and workload with work fatigue in office workers.

Keywords: Age, Working Hours, Workload, Work Fatique

INTRODUCTION

Every job, both in the formal and informal sectors, can cause work fatigue. One of the problems related to health and comfort at work is fatigue due to work. Work fatigue may decrease performance and increase work errors. In addition, other long term impacts may cause occupational diseases and work accidents (Alfiatin Eka Andriani, Avicena Sakufa Marsanti, 2021).

Work fatigue reflects the response of the entire body towards certain activities and exposures. Activities for 8 hours or more may lead to fatigue. Fatigue may cause symptoms of drowsiness, thirst and difficulty concentrating (Gaol MJL, Camelia A, 2018).

National Safety Council (2017) reported that a finding regarding workplace injuries where in 13% of which are due to work fatigue. It was shown that 97% of more than 2000 working adults who had experienced accidents had one risk factor regarding for work fatigue, while more than

80% had two or more risk factor. The combination of several factors lead to an increase in the potential for injury among workers (NSC, 2017).

Acording to the International Labour Organization (ILO), work accidents due to work fatigue lead to the daeath of two million workers die due to workers for almost every year. A previous study found that 32.8% of 58,115 samples or 18,828 samples experienced fatigue(Rahayu & Effendi, 2020).

The World Health Organization (WHO 2019), explains fatigue as a work-related phenomenon. In its publication of the 11th Revision of The International Classification of Disease (ICD-11), it is stated that fatigue may affect workers' health. Fatigue can also have an impact on a decrease in worker productivity(WHO, 2011). Acording to the Statistics Indonesia, 36% of work fatigue cases in 2019 were found to result in work accidents and 64% were caused by other things such as occupational diseases and work pressure(Biro Pusat Statistik, 2020).

Work fatigue refers to a condition of a decrease in efficiency and endurance during working hours. Such situation is a sign of fatigue which can be due to various factors, including work capacity, workload as well as additional workloads regarding the work environment. Work capacity (work shifts, age of workers, working hours, health of workers, working hours, nutritional status, work skills), workload (duration of physical and mental work), as well as additional workloads due to the work environment such as chemical (dust, gas and steam), physical (vibration, noise, lighting), biological (viruses, bacteria and animals) factors. Inappropriate working position or ergonomics such as standing, sitting, holding, pushing, pulling, lifting, rotating as well as psychological factors, regarding the work atmosphere such as the correlation between workers and company leaders are also influencing factors (Suma'mur, 2014b).

Age factor may also affect the body condition. A young person is expected to have a capability to do heavy work. Conversely, an older person may experience a decrease in the ability to do heavy work. Older workers may feel tired quickly and cannot move quickly when carrying out their duties and it can influence their performance. As age increases, muscle endurance decreases, so as to cause fatigue. In old age, muscle tissue shrinks and is replaced by connective tissue. The age of >30 years is still considered as the productive age. However, people inthis age category may experience a decrease in the work capacity by 60% to 80% compared to the work capacity of those aged 25 years, and it may lead to both physical and mental fatigue. Furthermore, it is known that skeletal muscle complaints begin to be experienced by people aged of 30 years and the level of complaints may continue to increase along with age(Ully Sarah, 2022).

Working hours in all workplaces are regulated in Law No. 13 of 2003 concerning Employment, specifically articles 77 to article 85. Article 77 paragraph 1, Law no. 13/2003 requires all businessmen to implement such provisions. Such working hour provisions have been regulated in two systems, including seven working hours in a day or 40 working hours in a week for six working days in a week or eight working hours in a day or 40 working hours in a week for five working days in a week. The second systems is eight working hours in a day or 40 working hour in a week for five working days in a week. Working limit in both systems is also determined, namely 40 hours in a week. Working hours that exceed the provisions can lead to fatigue (Undang-Undang No 13 Tahun 2003 Tentang Ketenagakerjaan, 2003).

Excessive workload can also have a negative impact on work quality and performance at work quality. There are order adverse effects including decreased in reaction time, an increase errors in decision making errors, a decreased in the ability to concentrate, and an increase in work accidents (Iristiadi, H ., 2014). Workload borne by the human body must be in accordance or balanced with the physical capacity and ability, cognitive ability as well as certain body limitations. The work capacity of one worker is certainly different from that of other workers, since it really depends on the level of physical fitness, skill, nutritional status, age, gender the body size (Purbasari & Purnomo, 2019).

Various causes of work fatigue can accumulate in the body which further causes feelings of fatigue. High levels of fatigue can cause workers to be unable to carry out their work properly. Therefore, work fatigue is a condition that should not be ignored. If workers' fatigue conditions continue to be ignored, the level of fatigue will continue to increase (Suma'mur, 2014b).

A study conducted by Ully Sarah (2022) among all Traffic Polices in District Police of Jambi (40 people) found that 29 respondents were ≥ 35 years old (72.5%) and 11 respondents were <35 years old (27.5%). The data analysis result revealed that there was a significant correlation between age and work fatigue with a p-value of 0.003 (Ully Sarah, 2022).

A preliminary study conducted by researchers on 3 June 2024 revealed that 4 workers experienced low level of work fatigue and 6 workers experienced high level of work fatigue. There were also several factors expected to be related to work fatigue, including internal factor of age. 70% of 10 workers were >30 years old and the other 30% of workers were <30 years old. Furthermore, the external factor expected to be related to work fatigue was working hours. It was found that 60% of workers worked more than 8 hours per day, and 40% of other workers worked

for 8 hours per day. Regarding workload, there were 60% of workers involved the high level category, and another 40% of workers were involved in the low level category.

Based on the background regarding conditions that might cause work fatigue, the current study aims to determine the correlation between age, working hours and workload with work fatigue among workers in the Office Department of PT X Cirebon.

METHOD

This current study applied a quantitative type with a cross-sectional design. The study variables included independent variables (age, working hours and workload) and dependent variable (work fatigue). The study population involved all office workers of PT X Cirebon for the period July 2024 as many as 63 people, who were selected using total sampling technique. Data were collected using it questionnaire consisting of questions regarding age, working hours, workload and work fatigue through interviews. Work fatigue was assessed subjectively using the Subjective Self Rating Test developed by the Japanese Industrial Fatigue Research Committee (IFRC). Data analysis was conducted using the chi square test.

RESULTS

Frequency Distribution of Age, Working hours, Workload, and Work Fatigue

Tabel 1. Frequency Distribution of Age, Working hours, Workload, and Work Fatigue

No	Variable	Category	F	%
1	Age	< 30 Years	6	9.5%
		≥ 30 Years	57	90.5%
2	Working hours	No Risk (≤ 8 hours)	11	17.5%
		Risky (> 8 hours)	52	82.5%
3	Workload	Low (0 – 15)	20	31.7%
		High (16 – 30)	43	68.3%
4	Work Fatigue	Low (30 - 75)	25	39.7%
		High (76 – 120)	38	60.3%

According to the study findings presentedin table 1, most of respondents by 90.5% were ≥ 30 years old and had a risk working hours (>8 hours) by 82.5%. Furthermore, more than half of respondents had a high level of workload (68.3%) and experienced a high level of work fatigue (60.3%).

Cross Tabulation

Table 2. Cross Tabulation between Variables

Variable	Category	Work Fatigue				Total		P Value
		Low		High				
		n	%	n	%	n	%	
Age	< 30 years	5	83.3	1	16.7	6	100	0.032
	≥ 30 years	20	35.1	37	64.9	57	100	
Working hours	No Risk (≤ 8 jam)	9	81.8	2	18.2	11	100	0.004
	Risky (> 8jam)	16	35.1	36	69.2	52	100	
Workload	Low	17	85	3	15	20	100	0.000
	High	8	18.6	35	81.4	43	100	

Acording to the study findings presented in table 2, the age variabel obtained a p-value of 0.032, working hours obtained a p-value of 0.004, and the workload variable obtained a p-value of 0.000. It was indicated that there was a significant correlation between age, working hours and workload with work fatigue.

DISCUSSION

Based on the study finding, 90.5% of workers in the office department of PT were ≥30 years old (risky) with a p value of 0.032. Thus, there was a significant correlation between age and work fatigue in the office department. Such finding is not in line with a study conducted by Ari Dwi Nugroho (2024), which found that the percentage of no risk age (54.5%) was slightly higher than the risky age. However, the statistical test result obtained the same p values of 0.000 which indicated that there was a correlation between age and fatigue (Ari, Dwi Nugroho, Ahmad, Irfandi;Mayumi Nitami & Shorayasari, 2024). The study finding is in line with a study conducted by Mukherjee's (2023) which found a p-value of 0.016, which indicated a correlation between age and work fatigue among private bank employees in India (Mukherjee, 2023). Furthermore, a study conducted by Koyuncu et al. (2021) obtained p-value=0.001, which illustrated that there was a correlation between age and work fatigue among private bank employees in Ankara, Turkey (Koyuncu, A., Ela, S., Yildiz, M. I., Kaymaz, O., Akbas, E. S., Gedikli, B., dan Yildiz, 2021).

Age is known as a factors that influences an individual's work ability. A decrease in physical capacity and changes in the function of systems in the body's organs can be developed as age increases. Thus, changes may also occur in a person's work capacity. A decrease in physical capacity and changes in the functions and systems of the body's organs as age increases may also change a person's work capacity.

In old age, the level of work ability decreases due to a decrease in physical condition, an fatigue may occur more quickly. On the order hand, younger workers have a relatively good physical condition so that their work capacity is higer and fatigue occurs more slowly (Ully Sarah, 2022).

Workers in the older age group may experience changes in their bodies. This process is accompanied by changes in the body's organs, cardiovascular system, hormones, and a decrease in the ability to work. A younger person can do heavy work, but an older person tires easily, is less agile, and less able to perform tasks, which reduce their ability to do heavy work and affect their performance (Suma'mur, 2014a).

The age factor influenced the incidence of work fatigue among office workers of PT X. Based on the study finding, work fatigue was experienced by employees aged ≥30 years. The effect of age on work fatigue was due to changes in the body's physiological functions. Age would influence endurance and work capacity.

A person's body endurance is influenced by age, because increasing age after a person reaches the peak of physical strength may further causes a decrease in the VO2 max, the ability of the immune system, the visual acuity, the hearing ability, accuracy, decision making ability, as well as the ability to remember in short terms. Therefore, the placement of workers must always consider age (Tarwaka, 2014)

According to the researchers' assumption, age was related to worker performance, because, since increasing age would be followed by a degeneration process of organs. Therefore, the capacity of the organs would decrease. Therefore, workers might experience fatigue more easily.

Working Hours

Based on the study finding, more than half of the respondents had working hours of >8 hours (82.5%) with a p-value of 0.004, which indicated that there was a significant correlation between working hours and work fatigue among office workers. Such finding is in line with a study conducted by Alfiatin Eka Andriani (2021) which revealed that more than half of respondents worked >8 hours by 73.9%. The results of the chi-square test analysis of the correlation between working hours and work fatigue among workers obtained a p=0.000, meaning that there was a correlation between working hours and work fatigue with an OR value of 31,000. Thus, working

hours of >8 hours had a 31 times higher risk of work fatigue compared to working hours of <8 hours (Andriani, 2021).

The optimum working hours for good performance is generally 8 hours per day. The rest should be used for life within the family and community, leisure time, sleep, etc, extending working time beyond the optimum capacity cannot be accompanied by optimal work effectiveness, efficiency and productivity. In fact, there is usually a visible decrease in the work quality and achievements. In addition, working for prolonged periods tends to cause fatigue, health problems, illness and accidents as well as dissatisfaction. 40 hours in a week is considered as the optimum working hours (Suma'mur, 2014a).

According to researchers' assumptions, exerting a large amount of energy to work for long periods of time will force the muscles, circulatory system, lungs and other organs to work harder. Working for a duration that exceeds capacity limits can cause a decrease in work productivity. Moreover, less than optimal use of rest time will cause fatigue, decline in health and work accidents. Thus, rest is needed while doing work, especially for office workers who have to deal with computers.

Workload

Based on the study finding, more than half of the respondents had a high level of workload (68.3%) with a p-value of 0.000, which indicated that there was a significant correlation between workload and work fatigue among office workers. A prevalence ratio of 10,000 was obtained from the Risk Estimate calculation which showed that respondents with a moderate level of workload were 10,000 times more likely to experience work fatigue than respondents with a low level of workload. In this study, there were no respondents who worked with heavy or very heavy workloads because the research was conducted during the Covid-19 pandemic era (Fandani & Widowati, 2022).

Work activities involve all body organs, muscles and brain, so that an increase in work activities indicates an increase in workload. Workload consists of two types, namely physical workload and mental workload (Suma'mur, 2014a). The study finding is in line with the theory explained by Tarwaka (2014) that the severity of the workload born by a worker should be adjusted to the ability or work capacity. Exceeding workload over than the ability and work capacity may result in work fatigue. The risk of fatigue among workers will increase if workers receive a high workload but are not balanced with sufficient rest time (Tarwaka, 2014).

According to researchers' assumptions, high level of workload can be related to work fatigue which can lead to risks of work fatigue indicated by decreased work motivation, low performance, low work quality, low productivity, lots of errors, occupational stress, occupational diseases, injuries and work accidents. Work fatigue can also lead to decreased work performance, unwell body feeling, decreased work morale, and reduced work productivity. For workload regarding tasks that must be achieved within a certain time period or quickly, there must be a break within the working hours, because it is important to reduce excessive workload and prevent work fatigue.

CONCLUSION

Age, working hours and workload were found as factors related to work fatigue among office workers at PT X cirebon. Institutions are expected to provide extra food in the form of milk or vitamins to maintain workers' stamina; organize/facilitate physical activity/exercise once a week as well as providing posters regarding the use of rest time and workplace stretching exercises.

Conflict of Interest

The authors declare no complict of interests in this study, both regarding competing financial interest or personal relations.

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